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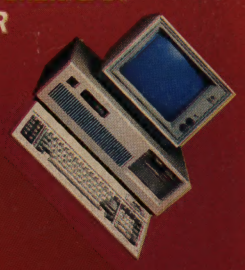

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- Epson Equity III—Review

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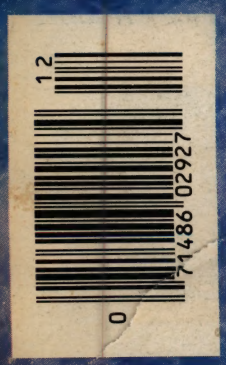

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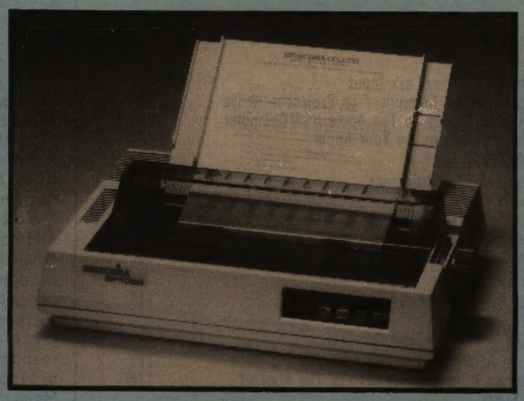

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|---|---|---|---|---|---|---|
| Standard Character | Standard | Pica | *12x9 | 80 | 10 | 100 |
| | | Elite | *12x9 | 96 | 12 | 50 |
| | | Condensed | *14x9 | 137 | 17 | 70 |
| | Near Letter Quality | Pica | *24x18 | 80 | 10 | 20 |
| | | Elite | *12x18 | 96 | 12 | 24 |
| Italic Cursive Character | Standard | Pica | *16x9 | 80 | 10 | 100 |
| | | Elite | *16x9 | 96 | 12 | 50 |
| | | Condensed | *18x9 | 137 | 17 | 70 |
| | Near Letter Quality | Pica | *32x18 | 80 | 10 | 20 |
| | | Elite | *32x18 | 96 | 12 | 24 |
| Graphic | Single Density Graphic | | nx8 | 480 dot column | — | 600 dot column |
| | Double Density Graphic | | nx8 | 960 dot column | — | 490 dot column |
| | Double Speed, Double Density Graphic | | nx8 | *960 dot column | — | 600 dot column |
| | Quadruple Density Graphic | | nx8 | *1920 dot column | — | *980 dot column |
| | 640 Dot Graphic | | nx8 | 640 dot column | — | 326 dot column |
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**CONTRIBUTORS**
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Lon Andrews, Randy Holcomb
Jeff Brenner, L. J. Kuten
Phillip Chien, Don Lancaster
Ted Drude, Cheryl Peterson
Mark Fendrick, Wynn Rostek
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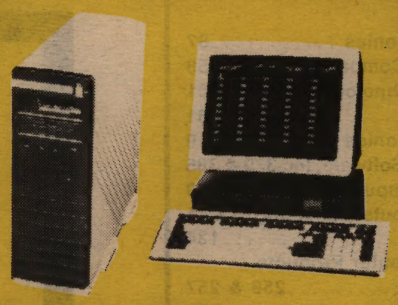

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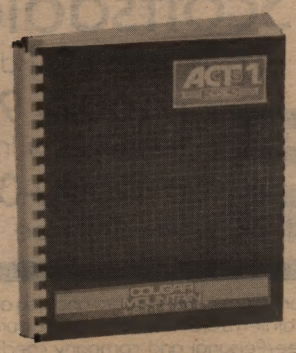


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# *COMPUTER SHOPPER's* Best Buys of 1986

by Stan Veit

*Computer Shopper* contains more advertising than any other computer magazine and it has one other characteristic with regards to its ads—they are all bargains! While this may seem more of a boast than a claim, it is true for one good reason, advertisers know that the readers of *Computer Shopper* are buyers rather than responders and they are sharp when it comes to a bargain. The advertisers know that they are doing business in a highly competitive market and their prices reflect this competition.

While all the advertised products are bargains, some are seen by our readers to be greater bargains than others. This year for the first time in the six-year history of *Computer Shopper* we are recognizing the advertisers who provided "The Best Buys of 1986" by awarding them a plaque with the Best Buy Award. These awards are made in 18 categories plus an award for the overall best buy.

The selection was made by votes of our readers who mailed in ballots inserted in copies of *Computer Shopper*. The results of this selection process may be somewhat imperfect because the appearance of a "Best Buy" may be the result of better advertising, or popularity of the items being offered. However, we were amazed how discerning our readers are when it comes to picking winners.

It must be noted that all of the buys were advertised in *Computer Shopper* and sold at the prices listed, however, these items may not be currently available from the advertisers, at the listed price, or at any price.

For the awards next year, we will again invite our readers to vote, only this time we will make each vote an automatic entry in a sweepstakes that will award lucky voters a prize as well as the advertisers.

Frank Billings, President of Patch Publications, with BCE's Best Buy Plaque.

### #1 Computer System
### Best Buy

This was one of the most competitive awards. There are so many great buys in computer systems advertised in our magazine that it is very hard to pick one. To win was not only to have the best computer, but the best package at the best price.

The winner is—The PC+ from Thompson, Harriman and Edwards Computer Products Company Ltd. sold through PC Network. This includes a PC clone with 256K RAM, a 360K floppy disk drive, dual clock speed, 8-slots, an AT-type keyboard and a 135 watt power supply. This is sold with a 1-year warranty and a 45-day money back guarantee. The wholesale price is $444, or $469 for a 640K system. Members of PC Network pay the wholesale price plus 8% and shipping costs.

### Accessory Card
### Best Buy

The winner in this highly competitive category is Ultra-Comp, 2600 N. Broadway, St. Louis, MO 63102; (314) 436-0396 for their Multi I/O Card, P/N M10B132.

This Multi I/O Card incorporates a built-in floppy disk controller that can drive two floppy disk drives, two RS-232C Serial Adapters, a Timer Port, a Parallel Printer Port and a Joystick Adapter. The cost is $99.00.

### Floppy Disk Drive
### Best Buy

When I first bought my IBM PC from IBM, I paid $560 for my second 360K floppy disk drive. Two years later that drive failed and I sent it to Proto PC for repair. Because Tandon Drives were scarce here in Titusville at that time, I bought a spare from the same company for $220! My, I thought, how prices have come down. It turns out that Proto PC wins the Best Buy Award for Floppy Disk Drives. They offer a PC-compatible 360K drive that is a replacement for my old Tandon, only the price is $79! In appreciation for this award, Proto PC Inc. will extend their offer and supply a Mitsubishi MF501A drive completely tested for alignment and with a one year warranty for the $79 price. Proto PC also sells hard disks and disk testing devices. They are located at 2424 Territorial Road, St. Paul, MN 55114; 612-644-4660.

### Hard Disk Drive
### Best Buy

This is the year of the hard disk drive and prices are so low that almost anyone with a computer can now afford a hard disk. Your Editor, who must be the first kid on the block with new equipment, paid $1200 for his 10Mbyte external hard disk system, way back when—oh well!

This was a hard category to pick since there are so many units for sale, however, the winner is—Computer Products United, 1147 E. Broadway #43, Glendale, CA 91205; (818) 796-8684, for a 20Mbyte package including a Seagate 20Mbyte drive, a Western Digital Controller, cables, software, operating manual and mounting hardware. The price for this complete system is $439.

### Modem
### Best Buy

Modems have become faster and cheaper in the past year. Formerly the main entries in the modem business were the same companies who sold high priced modems for large computers. Now low priced imports have become available. The problem has been to pay little and still get a quality product. Megatronics, the winner of our Modem Best Buy sells modems that are FCC approved, fully warranted for one year and comes with a 29-page full color user's manual. They also provide a toll free service and assistance number. The model they won with is an Avatex 1200- 300/1200 Baud, Direct Connect, Auto answer and Auto Dial Modem. It is Bell 103 and Bell 212A compatible for tone or pulse dialing. It has 8-option switches and uses standard RS-232C DB25 connector and a telephone connection jack. There are 8 LED status indicators on the front panel and it is Hayes AT command compatible. The amazing price for all this is $109.

### Video Monitor
### Best Buy

Monitors are one of the baffling things to buy. There are so many different kinds and prices. Starting at Medium Resolution (no one makes a low resolution) and going up to Super High Resolution its hard to recognize a Best Buy. Our smart readers picked the Luxor Hi Res RGB Model 190-9528. This is a 14" Monitor that is IBM compatible with 16-true colors, 25 MHz bandwidth, 640 by 262 resolution and a 31mm Dot Pitch. It only costs $299.95 and includes an IBM PC cable which others charge extra for. The vendor is JDR Micro-Devices, 1224 S. Bascom Avenue, San Jose, CA 95128; (800) 538-5000 or (408) 995-5430.

### Impact Printer
### Best Buy

This year has been "the year of the printer," more models came out with more features and lower prices than ever before. This made it very hard for readers to choose a best buy so they picked one of the "old reliable" machines that has been around for a few years. The printer was the Star Micronics Gemini 10X and what made it a best buy was Midwest MicroPeripheral's price of only $179. Midwest MicroPeripherals, 135 S. Springfield St., Saint Paris, OH 43072; (800) 423-8215 offers many other good buys. This sale was considered outstanding.

### Laser Printer
### Best Buy

Laser printers sold for more than $5,000 a short time ago. Prices have been coming down slowly and our readers picked USA*Flex, 135 N. Brandon Drive, Glendale Heights, IL 60139; (800) USA-FLEX as a Best Buy for its offering of a Hewlett Packard Laserjet printer for $2,295 including toner cartridge and both a serial and a parallel interface.

### Buffers and Data Switches
### Best Buys

Computer Friends, 6415 SW Canyon Ct. #10, Portland, OR 97221; (800) 547-3303 has been selling Reinkers for printers for a long time. Last year they branched out into data switches and modems. Their Proteus 64K Buffer wins the Best Buy for its class. This unit connects two printers or other parallel peripherals and provides buffers on ports 1 and 2. It has both manual and software switching capability. Proteus comes with a one-year warranty and sells for only $199.

### Chips And Parts
### Best Buy

Before there was a personal computer industry there was a James Electronics, now called Jameco Electronics, 1355 Shoreway Road, Belmont, CA 94002; (415) 592-8097. They have always sold everything in electronics, chips and parts at record low prices. In addition, they will sell you small orders that other parts vendors would not bother with. It is no

continued on page 8

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# Editorial

By Stan Veit

## The Djinn Is Out Of The Bottle

In the tales of olden days, there were mysterious spirits called Djinns or Genies who could grant wishes, but were mostly known for making mischief in the world. The way these Djinns were controlled was by sealing them in a bottle where they could exist harmlessly forever. If you released one of them from the bottle, you got either one, or several wishes. The old stories often tell the story of people who made wishes and got more than they bargained for. The Djinn was very tricky and having granted the wish was now free to go out and make trouble in the world, forever.

Getting the Djinn back into the bottle was almost impossible and the stories never told who put them there in the first place.

Looking at the state of the microcomputer business and the closely related semiconductor business in the United States, one must conclude that several Djinns are hard at work making things as difficult as possible.

One example: The American chip manufacturers protested that the Japanese were dumping chips in this country. As a result agreements with the Japanese were made to curtail this practice. The prices of memory and other American chips have just about doubled since then. Are the chip makers happy at this? Well they got what they wanted right now. In the long run however, they will be very unhappy because the few remaining American computer manufacturers cannot compete with equipment made offshore so they are closing down their American factories and turning them into warehouses. They are having their products made in the Far East where not only is labor cheaper, but so is silicon. The moral to this story is simple. When you put your finger in the dike, the Djinn opens another larger hole just out of your reach!

Another example: The success of the IBM PC can partially be attributed to the fact that it has an open bus. This made it easy for a whole industry to develop supplying expansion and enhancement boards for the PC/XT/AT family of computers and gave the computer owners almost unlimited choices in configuring their computer systems. In fact no other popular computer since the S-100 machines ever gave the user so many choices.

The whole open bus idea is also called "The Woz Principle" because Apple used it for the expandable Apple II. (It really should be called "The Roberts Principle," after Ed Roberts who invented the S-100 Bus.)

Although Apple left their bus open for outside developers, they protected their designs by extensive use of ROM-based firmware to accomplish things that others did in hardware.

This system protected Apple from infringement by clone makers and they were able to stop Franklin and the flood of cheap Asian clones.

The only thing that IBM protected this way was their BIOS and the kernal of BASIC which were embedded in a ROM. However, Microsoft owned MSDOS (which was equivalent to PCDOS) and also owned the BASIC used in the IBM ROM. All any competitor had to do to obtain operating software for a PC/XT clone was to license MSDOS, and GW-BASIC from Microsoft and write their own BIOS. The design was open and all the chips used in the PC/XT/AT computers were common commercial components. Anyone could copy it and build a clone as good as the original.

It took almost a year for the first PC clones to appear. I did not count the first Compaq computer as a clone because they developed the first PC portable and it could display both monochrome and color from the same board, something that IBM could not do. The IBM Portable was really a Compaq clone! It only took four months to clone the XT and only a few weeks for the AT-pre-clones to appear. The 80386 computers have appeared before the IBM version has even appeared on the market, now that's fast!

I now read in the trade papers that IBM and Intel are going to develop proprietary large scale Application Specific Integrated Circuits (ASIC) that will incorporate many computer functions on one chip. This will cut down the chip count and protect the IBM design by casting it in silicon. However, this will only occur in future computers. Some of the clone makers are already using Application Specific Integrated Circuits (ASIC) made by Chips and Technologies Inc. and others, with their PC/XT/AT versions. An ASIC is now under development combining many of the functions of the 80386 and making low cost versions of this advanced computer possible before IBM has even brought out its version. IBM and Intel are only starting what others are already doing.

Another technique available to anyone desiring to use it is called Surface Mounting. This eliminates the need for complex PC boards by mounting many chip wafers on a single substrate and thus creating a solid complex circuit. All of these techniques will enable the clone makers to duplicate the functions of ASIC chips without having the same chip.

It is therefore obvious that as far as the existing PCDOS/MSDOS computers are concerned, the Djinn is out of the bottle and can never be put back into it again. IBM no longer controls the majority of the market and if they came out with a new and different design, it is they who would be non-compatible with the de facto standard, not the rest of the industry. The design is now generic and business and the rest of the computer using world is firmly committed to it. They will not give it up because there is too much money invested in hardware and software. Perhaps in three to five years when the existing machines are written off and someone comes out with a newer and better computer, the window will re-open.

You may wonder why I am writing about this and what relationship it has to *Computer Shopper*? We are the leading magazine of the clones and people have asked me how long the clone business will last. I feel that the present generation of PC/XT/AT clones is good for three years and that as the next generation comes along, it too will be cloned as fast as it reaches the market.

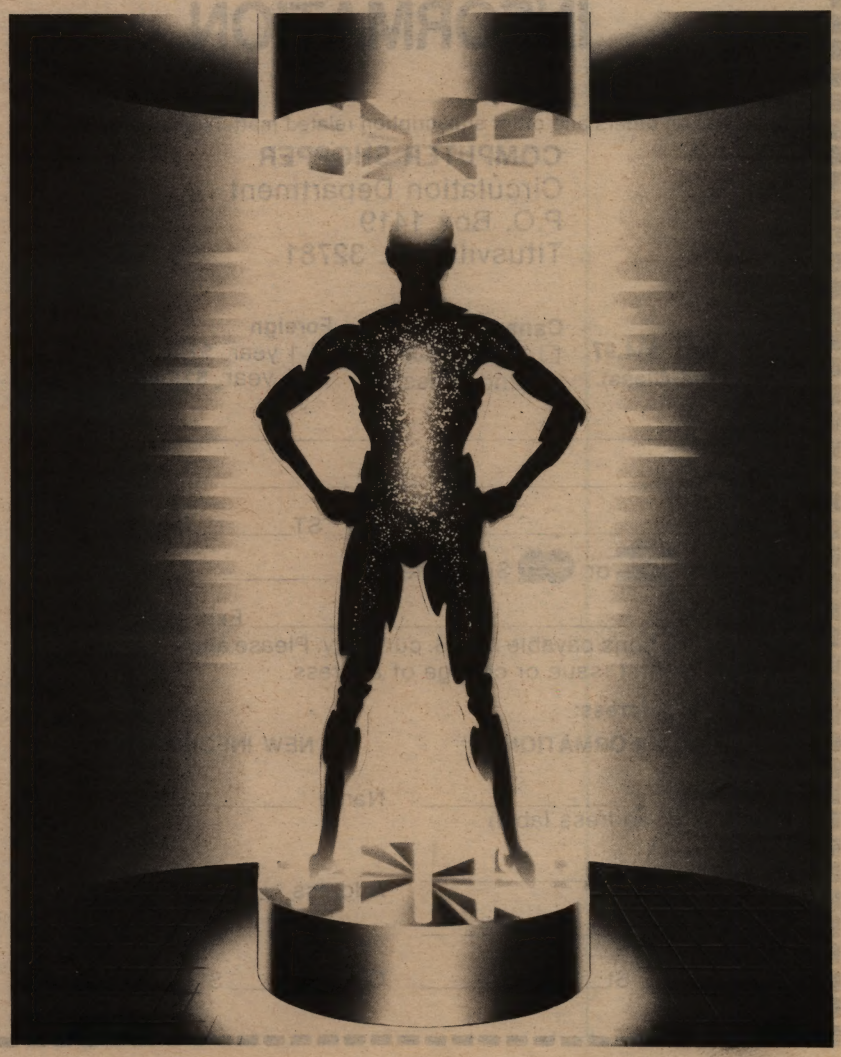
### Who Benefits From This Technology?

All of these new manufacturing techniques make it possible to make computers cheaper and more reliable, therefore at the time of purchase the public benefits as well as the manufacturers. However, the problem of maintenance and repair becomes more difficult. We will now truly have throw-away computer components. When major parts of the computer are embedded into large scale chips and there is a failure, the entire chip must be replaced. When this happens you are throwing away the good parts with the bad and that is expensive. In the old computers you might have a failure of a TTL chip costing a few cents. This might have taken some time to locate, but the repair was cheap. In most cases you isolated trouble to a board, replaced the entire board in a few minutes and were back in business. Later the defective chip could be located and replaced when it did not hold up a computer job.

Under the new methods, the large integrated chip is located on the main board and may be surface-mounted right into the board. If something fails you are faced with the problem of replacing the entire main board, or the complete computer. Who will stock complete main boards for all these computers? What will it cost?

Will we go back to the motherboard concept where we have a motherboard full of sockets and all the components are on plug-in cards? That is what we had with the old S-100 bus and it worked fine, but that is the most expensive method of building computers. We can never have $500 ATs that way.

Meanwhile the Djinn are loose and the world will never be the same. ●



**Best Buys**
**continued from page 5**

wonder to me that they came up on our Best Buys list. I was surprised that so many of our readers are interested in replacing their 8088 CPU chips with the fast NEC V20. There are several advertisers for these parts but Jameco sells the V20 8MHz CPU for $10.95. These replace the 8088-2 from Intel. This is a Best Buy winner.

### Floppy Disks Best Buy

There are hundreds of ads for floppy disks, but the ad by Magnetic Media of New England, P.O. Box 780, 234 Cabot Street, Beverly, MA 01915; (800) 992-0123 in the September 1986 *Computer Shopper* is rated as a Best Buy in disks. This ad for one time only, advertised 5¼" DSDD Bulk diskettes for $00.39 in 100 minimum lots. What made this a Best Buy was the price included Tyvek envelopes, write protect tabs and plastic hub-rings.

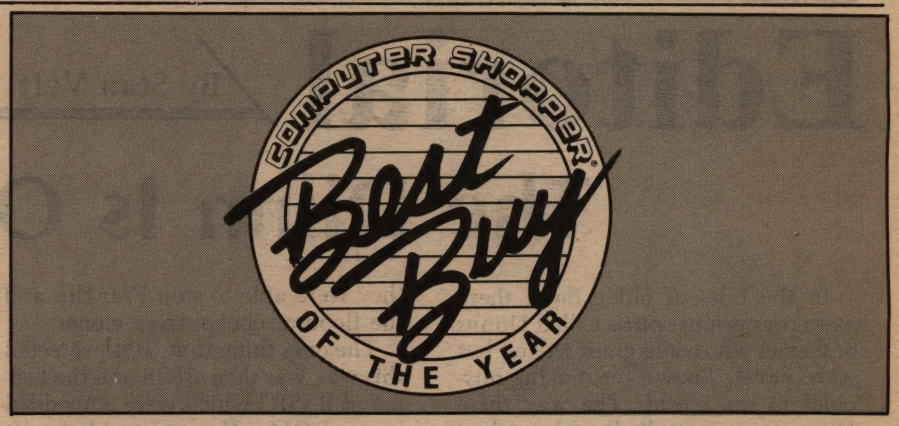
### Best Liquidated Item Best Buy

Some of the biggest bargains in *Computer Shopper* are items sold by Liquidators to move stocks of items no loner being made by manufacturers. Components Express, 1310 Edinger, Santa Ana, CA 92705; (800) 432-8459 seems to have topped them all with their liquidation of the popular Sharp PC5000 portable computer. This machine complete with 128K RAM, MSDOS, GW BASIC and a battery pack originally sold for $1995. Components Express liquidated this portable for only $395. In addition, they sold all the peripherals for the Sharp PC5000 at "give-away" prices. The printer which listed at $395 sold for $95, the modem at $85 and RAM expansion at $440 for a 64K cartridge, or $65 for a 128K Bubble cartridge.

For users wanting complete systems, bundles of computers, peripherals and software are offered at even greater savings. Software is also offered for the Sharp at liquidated prices. This has got to be one of the best portable sales ever offered.

### Software Best Buys

Determining best buys of software is much harder than hardware. Making a decision on the basis of reader votes is probably not the best way of selecting software Best Buys, but it is the best method we could think of. In some cases the votes went to those selling well-known software systems at discount prices, in others it was original programs sold direct by the publishers. This became a value judgement on the part of those selecting the software and things like the popularity of the subject entered into it. In one case the decision between Mix Software C Compiler and Ellis Computing's languages was very close. We suspect that next year, the growing popularity of the C language will make Mix C one of the most popular versions and a best buy.




### Business Application Software Best Buys

This one was easy. Cougar Mountain Software, 2609 Kootenai, Box 6886, Boise, ID 83707; (208) 344-2540 has such an excellent reputation for its ACT1 Professional Accounting Software that sells for only $99.50 with a 200-page manual and a 30-day money back guarantee that there was hardly any contest. This system must be judged against others costing more than ten times the price.

### Database Software Best Buy

This is a case where a company selling a well-known package for a discount price won the award. The winner is—LOGICSOFT, 110 Bi-County Blvd., Dept. G, Farmingdale, NY 11735; (800) 645-3491 for Knowledgeman II selling for $275.

### Languages & Utility Software Best Buy

The well-known Utah series of computer languages from Ellis Computing Inc., 5655 Riggins Court, Suite 10, Reno, Nevada 8902; (702) 827-3030 are all Best Buys. This family of computer languages includes COBOL, FORTRAN, Pascal, PILOT, and BASIC and an EDIT program all for only $39.95 each. These are all MSDOS languages, however, Ellis also still sells the Nevada series of languages for CP/M at the same price. All Ellis software is guaranteed and is non-copy protected. If you're not completely satisfied, they will refund your money within 15 days!

### Word Processing Software Best Buy

Batteries Included, 17875 Sky Park North, Suite P, Irvine, CA 92714; (416) 881-9816 and 30 Murial Street, Richmond Hill, Ontario, Canada wins the Best Buy Award for its famous Paper Clip Series for Commodore 64/128, all Atari computers, Apple IIe/IIc and now for MSDOS PC/XT computers.

### Entertainment Software Best Buy

Again the award goes to a discount price for a major software package. F-15 Strike Eagle for the PC sold for $24 by Lifestyle Computer Products, 25381-G Alicia Parkway, Suite 350, Laguna Hills, CA 92653; (800) 257-6094, in California; (718) 855-0924.

### Integrated Software Best Buy

The buzzword for this year is Integrated Software and there are countless packages on the market combining everything you need in one big ball of wax. (Soft wax?) Many of them follow the Universal Law of Multi-Purpose Devices which states that the parts are never as good as a single purpose device design for a specific use. In spite of this they are handy to have in your computer especially if they live in the background and don't need to be found until you need them.

The Best Buy Award for Integrated Software goes to PC-Desk by Software Studios, 8516 Sugarbush, Suite 104, Annandale, VA 22003; (703) 978-2339.

This software system includes a Word Processor, Personal Address Book, Database, Mail Merge, Calculator, Auto-Dial On-Screen Clock, Encryptation of files, Logs for client billing, tax records etc., Memory Partitioning and Calendar/Reminder. It comes with free support and free updates with a 60-day money back guarantee. All of this at a special offer of $79 plus $5 shipping and handling.

### And Now The Overall Best Buy of 1986

Roll the drums and sound the trumpets—here is the announcement everybody has been waiting for. **The Best Buy of 1986!!!**

Every month *Computer Shopper* contains the red pages with the monthly liquidation offers from BCE Authorized Liquidators, 3233 K Street, NW, Washington, DC 20007; (800) 545-7447.

The buys in these ads are simply fantastic and everyone of them is a bargain that is only available while the supply lasts.

In the October issue BCE advertised the sale of the CORDATA PC-325 (formerly Corona PC) a top quality PC compatible made by a major manufacturer. This system originally sold at the low price of $2995 is now being sold for the liquidated price of $749 for a 256K model or $799 for a 512K unit. This price is not for a system unit only, but a complete system including not one, but two floppy disk drives (360K each), a 14" Hi Res Tilt/Swivel Monitor, Serial and Parallel I/O ports, Four full length slots, 110 watt power supply. MSDOS, GW BASIC and PC Tutor included. Even at this price you get a 90 day manufacturer's warranty and a 15-day return privilege. ●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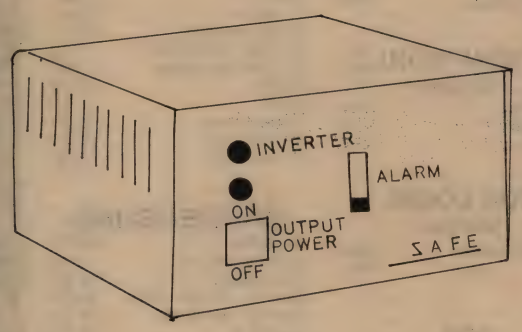


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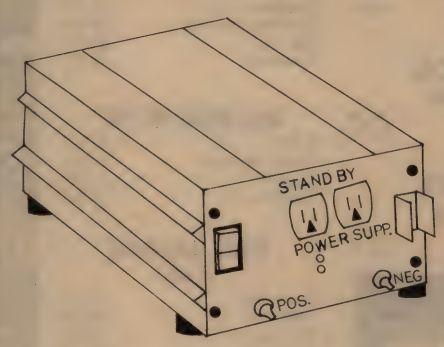


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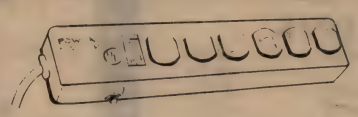

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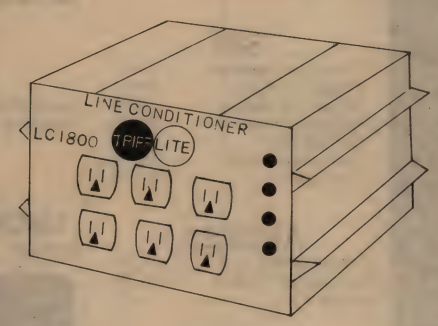


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# Word Processors Still To Come

by Hal Nieburg

The next wave of software will be tailored to user special requirements. It will be what might be called niche software. Powerful and fast CPUs and unlimited dynamic RAM will make some level of AI (Artificial Intelligence) de rigour; competition will be furious to offer special purpose features.

It is my purpose here to explore the word processors of the future, a little bit of tongue-in-cheek. Software designers and marketeers are always on the lookout for new concepts and arresting names for their products. It is time to explore all the nooks and crannies of the market need to exploit the untapped capabilities of the microcomputer.

### Brainstorming The Future

Readers are invited to invent their own additions to the list, thereby aiding the programmers and shaping the directions of future software. This is not a time for caution or for faint hearts! We must be wildly inventive. That is the only way to reach out into tomorrow.

The object must be to figure out all the services people want from a word processor, and develop programs that allow the computer to automatically perform all but the most critical functions.

We should be inspired to the task by BREAKTHROUGH (Profit Technology, New York, N.Y. 212/809-3500, $740), a subliminal creativity booster. This program is called "a mind catalyst," flashing in windows randomly placed on the screen powerful ideas and phrases (culled from the Great Books, philosophy, the Arts, current articles in such journals as *Psychology Today*, etc.) on the screen while the user works out his own ideas.

There can be a number of similar special purpose products, working on the same principles. WRITER'S CRAMP is advertised as a peregoric for blocked writers. Every now and then subliminal messages flash on the screen, such as "one more paragraph and you can go pee."

LOGORRHHEA is for people with the opposite malady. They always write too much. The subliminal messages aim to abort a paragraph with phrases such as "The house is on fire!" For more serious cases, there is PROLIX (not to be confused with PROLOG, an AI programming language), a word processor with an automatic filter that arbitrarily deletes the last 20 words whenever the writer pauses to catch his breath.

Another beacon should be INSULTS2 (Modern Advisory Institute, Salt Lake City, UT. $5). This brilliant memory-resident utility builds a set of key macros into any software. When the unsuspecting operator returns to the computer and hits a key, the machine insults him/her. The insults are bright and arresting: "Watch it, Buster, your hands are as cold as a pawnbroker's smile!" A variation could be RUDE, a word processor with 2000 built-in special occasion insults, insertible in the text by the user.

There is already a SCRIBE, a somewhat conventional package. What about designing a PRESCRIBE? This would be for MDs only. They need only enter a code and the software fills in the prescription form—in a special font, which could be called Illegible Latin. Even your pharmacist can't make head or tails of it.

DOUBLETALK would be useful for politicians, and others who are trying to talk themselves out of tight spots. (Not to be confused with DOUBLEDAS, a multitasking utility for bisexual users.) Unlike programs that clean up the writer's turgid prose, this program does the opposite. You put in plain English, and it comes out gobbledygook.

GHOSTWRITER could be a best seller, probably by Borland, using the TURBO LIGHTNING engine. The operator puts in a single word, say "patriotism," and a whole speech comes up on the screen, with topical blanks which the user can fill in to give the speech a local flavor.

The textbase that comes with this package is full of phrases and paragraphs from *The Oxford Dictionary of Quotations, Bartlett's Familiar Quotations,* excerpts from the *Reader's Digest,* and from the *Congressional Record.* The secret of the program is a line of randomization code. The Mario Cuomo Gloss is a nice Add-In, containing 300 quotations from his immigrant parents, such as "Some day America will prove that even an Italian boy from Brooklyn can be president!"

THE PLAGIARIST uses the same engine but is tailored for college students. The text base is full of excerpts from a large collection of proven "A" quality term papers. On every American campus, special disks are available with quotations from the works of local professors, and a routine, by hitting a single key, that inserts a few quotes from the professor's books.

There is a special utility which makes it possible for the student to build up his own database of phrases. One merely types in material directly from the textbook; the program scrambles and paraphrases the words so as to make them untraceable.

DUDLEY DO-WRITE will be a smash-hit for the younger generation. In the first efforts at English composition, it will automatically correct gram-

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# Tales of Horror in Office Automation

by John J. Anderson

Blizzards of paper, missed telephone calls, duplicated duplicating—is that how you would characterize activity in your office? You must suspect office automation can make things simpler; that might be the reason you are reading this. But are you also concerned it could actually make matters worse?

Glad to hear it.

Office automation—it often remains less of a miracle than an unfulfilled promise. Those who have inflated expectations can end up getting really burned. To take the automation route successfully means understanding, planning and controlling the operation carefully—a rather daunting prospect. Anticipate having to turn over critical office functions to computer gurus (consultants, system analysts or your local dealer), in whom you must have confidence akin to religious faith. There is the risk that you may unwittingly defer to their judgment only to end up with an office that runs you instead of vice versa. No less disconcerting is the tendency of these sages to bend all problems to fit software solutions rather than seeing how they fit into the larger business picture.

In your mind's eye you see cables running all over the office and computers babbling away on every desktop—unable to communicate with one another. You also have a battery of peripheral equipment—printers, disk drives, modems—so dedicated to the computer they "belong" to that they are incompatible with any other. One day you suddenly realize that what you have is not a sleek, efficient computer system but instead a veritable Tower of Babel.

To save your office from this techno-fate, you'll need more than a smattering of the language of office automation. You should be able to articulate your office's needs and comprehend how high-tech equipment can fulfill them. Equally important, you must grasp the limitations of these new technological marvels and learn to anticipate the new breed of problems they undoubtedly will foster.

Here are some sad fables for the benefit of those embarking on the path toward office automation. Beware these three common pitfalls: the stifling of the one-notched belt; the soreness of terminal chafe; and the heartbreak of elephantiasis. If you fall into any of these traps, climbing out costs time and money. Obviously, the trick is not to get trapped in the first place. Allow us to help you anticipate.

**Trap 1: The Fable of the One-Notched Belt**

Harry has carefully chosen a consultant steeped in technological lore, and together they work out a system that covers all the contingencies of Harry's business. He opts for a minicomputer unit connected to three workstations running software the consultant specially custom-molds to the office work flow. Each person works independently at a separate terminal, yet everyone can share data and work on the same files. For the first six months, the system operates like a dream. Harry is relieved, he stops spouting techy language constantly on the phone, and he gets back to the real business at hand.

Then things gradually get out of hand. Thanks to Harry's acumen the business grows, but the computer system is unable to keep up. He wants to bring his accounting in-house, but his system doesn't have enough power to handle it. Nor can it accommodate more terminals when he hires additional staff. Because of his overwhelming concern with customizing the system, Harry committed to one too seamlessly tailored, too tight-fitting to allow room for growth. His "perfect" system proves ultimately ineffective—running smoothly only if his business stagnates.

It's like having a talented designer make Harry a belt with a single notch. Perfect, yes—but not very flexible in the long run. And why didn't the consultant anticipate all this? Because Harry chose one more skilled in programming than in fitting technology to business needs. Perhaps the consultant *did* suggest (more expensive) alternatives to the system he ultimately bought, but at the time he thought them extravagant—now his disciplined budgeting looks more like a nickel-and-dime mentality, and Harry regrets that deeply.

*Moral:* Above all, throughout the move to automation, you must recognize the need for a flexible system. That way your technology can grow as your business grows, even adapt as your business changes. Otherwise, your business risks becoming shackled by the technology that serves it—and you'll end up being inconvenienced until you can afford to invest in remedies.

*Avoiding Harry's Fate*: Keep you mind focused on your business first, then your computers. You know much more about how your business runs and how you expect it to grow than your consultant (or dealer) ever will. You are the one who will be running the show after your consultant has finished and moved on to a new job in Timbuktu. Insist on having a system that can double, triple, or quadruple in size whenever your business requires it. Make sure the system is fully souped up to make expansion easy when the time comes—otherwise you risk having to pay more for service and backup consulting at each stage of growth. By keeping a clear view of your business priorities, you can avoid being caught up in needlessly expensive technological euphoria. At the same time you won't be blinded by dollar signs every time your consultant mentions

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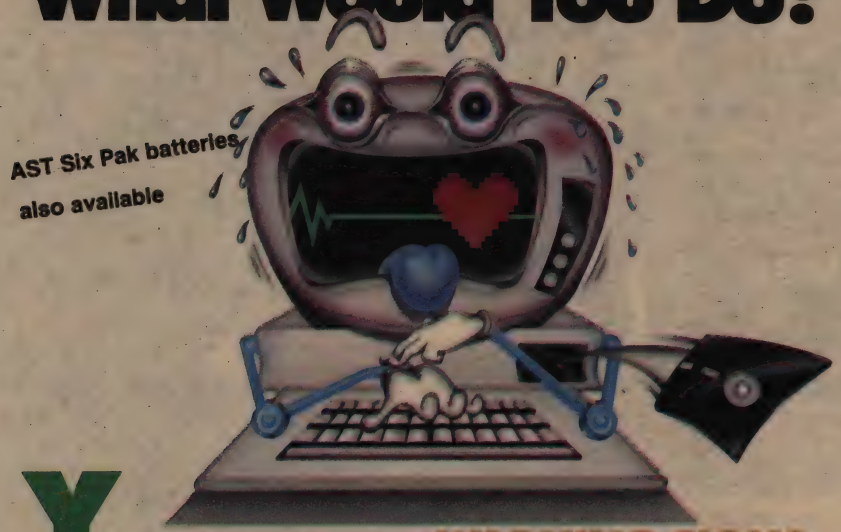
**Sudden AT™ Death. What Would You Do?**




***You turn on your AT™ computer and suddenly it starts to happen. Your computer starts gasping for information because your AT battery is dying. The simplest data, like the time and date, becomes a struggle. All vital signs start fading from the screen. Without action, the victim will soon lapse into unconsciousness.***

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**WARNING SIGNS**
- Clock calendar function fades and disappears
- Configuration files vanish

**Steps to Take In Case of Sudden AT Death**
- Do not panic
- Do not move injured computer
- No need to call repairman
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**Chi-Writer** (108) Multiple font/scientific word processor.

### GAMES

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**SpaceWar** (203) and other basic programs
**Arcade Games** (204) Kong, Pacman, Pango, and Bricks.
**Trivia Game** (208-209)
**FlightMare** (212) Be a fighter pilot in the future
**Castle Adventure** (213) includes Membrain ram disk software.
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**Trucker** (215) Drive an 18 wheeler from LA to NY. Watch out for Smokie!
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Trivia Towers (219-220)
**JumpJoe** (222) like Donkey Kong (requires color monitor)
**Hopper** (224) "Frogger" clone
**Aardvark** (225) ABM, QUBERT, Temple, and Bugs.
**Tune Trivia** (226) and Monopoly PC
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**Kermit** (305-306) communicate with mainframes (with source code)
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**PC-Talk** (310) modem communications
**RBBS-PC** (311) multi-user BBS. CPC 12.5B version 1.8
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### MUSIC

**PC-Musician** 1.7 (2401) Develop and play back songs on your PC.
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### HACKERS/SECURITY

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Unprotect Programs (402) This disk gives you tips.
**Encode/Decode** (401) Protect your files from others.

### SPREADSHEETS

**PC-Calc** (501) Spreadsheet can have up to 26 columns and 255 rows.
**FreeCalc** (502) Spreadsheet can have up to 25 columns and 100 rows.
**Calc** (503-504) up to 65 columns by 256 rows. Linked spreadsheets can provide "3-D" capabilities.

### SPREADSHEET TEMPLATES

**Lotus Utilities** (601) Convert text files into 1-2-3 loadable format.
**Formula Documentor** (604) use to make 1-2-3 spreadsheets more understandable.
**Lotus 1-2-3 Utilities** (606) Macros.
**Lotus 1-2-3 Utilities** (607) Spreadsheet templates.

### GRAPHICS

**KeyDraw CAD** system (703-704) Requires color graphics.
**PC-Graph** (705) Create plots from PC-FILE data files.
**Designer** (706)Graphics editing (requires BASICA and color graphics)
**Digi-Draw** (708) Program emulates paper and pencil drawing on your PC (requires color graphics)
**Sideways** (709) Prints text sideways
**DrawMan** (711-712) Create bar graphs/slide shows from DIF files.
**Pixel-It** (716) Drawing program requires color graphics adapter.
**3-D** (719) Allows you to create, edit, and save 3 dimensional objects.
**Draw.bas** (720) Draw circles, lines, boxes, change background and palette colors, save and load files to/from disk.

### ACCOUNTING/FINANCE

**The Portworth Package** (801) Monitor and evaluate your stock portfolio.
**Finance** (802) Determines present and compound values; perform mortgage, loan and bond analyses.
**PC-General Ledger** (803) Written by a financial executive with more than 25 years of experience.
**Time and Money** (805) Helps you to manage your precious time and money.
**FM.EXE** (806) Finance Manager.
**TaskPlan** (807) Evaluate costs of your companies' workers tasks.
**CPA Ledger** (808-810)
**Mr. Bill** billing program (811-812) Helps you bill your clients.
**ANALYST** (818) This program allows the user to analyze the costs of moving into a new house.
**Stock Charting System** (819) Allows you to create and output volume high/low close charts for stocks that you choose.

### FORTH

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**PC-File** (901) User friendly filing system.
**Inventory** (911) Parts inventory control system.
**File Express 2.95** (912-913) Powerful and user friendly Data Base manager.
**pBASE 1.02** (917) Cross between dBASE and IBM's SQL.
**3 by 5 1.0** (918) An easy to use index card filng syustem.
**NewBase** (919) Menu driven database system.

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**EpiStat** (1001) statistical package.
**Statistical Tools** (1002-1003)
**EightCurv** (1004) Fit eight curves to a set of ASCII numeric data.
**SPPC** (1005) Demo allows you to perform simultaneous and hierarchical multiple regressions.

### BASIC

**PC-Professor** (1102) BASIC Tutorial
**BASIC program generator** (1103) Answer questions, and this program creates the source code for you.

### PASCAL

**Turbo Pascal Sub-Routines** (1202) Includes the source code for some graphics demos.
**Turbo Pascal Tools** (1203) Includes routines to draw circles, hide the cursor, write diskette labels, and more.
**Turbo Sprites** and Animation (1207)
**Pascal and "C" Tools** Vol 1 (1209)
**Turbo Pascal Tutor** (105)
**Turbo Games** (719) Includes Wumpus, Life, and Lander.

### "C"

**XLISP 1.5** (1301) with "C" source
**Small C compiler** (1302)

### ASSEMBLY LANGUAGE

**CHASM** (1501)
**Tiny BASIC Interpreter** (1105)
**LANGUAGES: MISC.**
**LadyBug LOGO** (1601)
**DSCREEN** (2802) dBASE II screen generator.

### DOS

**ASSIST** (106) Memory resident DOS help
**DOS help** (1901) Disk based DOS help
**DOS-a-matic** (1903) Menu driven program makes using Dos a cinch.

### ARTIFICIAL INTELLIGENCE

**ESIE** (2001) Explore the futuristic world of expert systems.
**Eliza** (223) The famous therapist AI demonstration program.

### EDUCATIONAL

**PC-TOUCH** (2502) Typing Tutor compiled with BASIC source.
**MATHPAK** (2506) Math Tutor includes instructions on addition, Hex/Octal conversions, trig functions and more.
**QUEST.BAS** (2507) Learn about American history while playing an adventure type game.
**PC-Professor** (2513) BASIC tutorial
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**Funnels and Buckets** (2517) This game makes learning basic math skills. fun.
**Batch File Tutorial** (419) Learn how to use this time saving feature of DOS.

### UTILITIES

**FRED** (2701) Full screen editor
**EDIT** 1.11 (2703) Full screen compiled editor
**Editor** (2704) written in C, with DeSemet C source code. Editor supports macros.
**ROFF** (2801) technical text formatter with C source code.
**Xword** 2.12 (2802) Translate to and from different text formats.
**UNWS** (2805) This assembly language program strips the high order bits from files saved in WordStar's document mode.
**Epson Printer Utilities** (2902) Allows you to change modes for your Epson printer.
**FASTPRT** (2907) Fast version of the DOS print screen function.
**Membrain** (3001) Allows you to set up an extremely fast RAM disk.
**Hard disk utilities** (3201) includes CED, Partner 1.1, and POPALARM.
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**DeskMate** (3203) SideKick like program.
**Monday** (3204) Allows you to keep track of your appointments.
**BASIC Utilities** (3401) Includes CALCULATE.BAS, IBMLABEL.BAS, and EASYRITE.BAS.
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**Browse and BackScrl** (3403) Allow files to be viewed backward and forwards.
**FreeCopy** (3405) copies disks with source code.
**Miscellaneous utilities** (3412) includes AXX,CED, and EQUIP102.
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**Miscellaneous Utilites** (3415) Create hard copies of directories for your disks.
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**PCWINDOW** (3416) Poor man's version of SideKick.
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**Newkey** (3419) create your own macros.
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| ds/dd color pack assortment A flippy † | .69 |

† Color pack assortment A: red, orange, yellow, blue, green.
† Color pack assortment B: maroon, brown, dark blue, silver, gold.
† Color pack assortment C: pink, med. blue, beige, white, light grey.
† All colors are available separately, except flippys.

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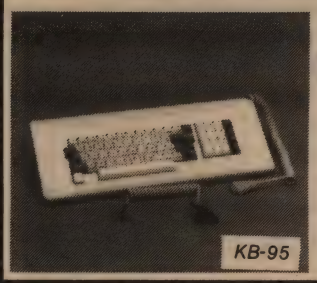


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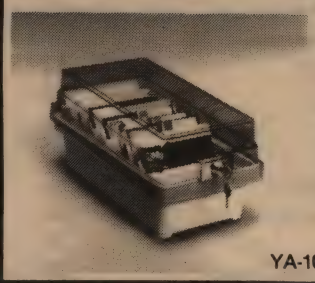

- Anti-static
- Elegant appearance
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- Nine movable dividers
- Non-slip guides keep disks upright and flat

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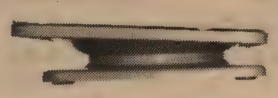

- Tilts and swivels display
- Rotates 360°
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- Holds all size monitors

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- Apple II+, IIe, IIc, or IBM pc compatible
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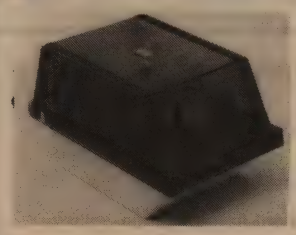

- Anti-static
- Built-in carrying handle
- Elegant appearance
- Smoke top w/white base
- Protect up to 50 5¼" diskettes
- Five movable dividers
- Non-slip guides keep disks upright and flat

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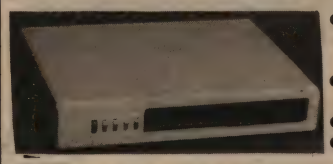
### IBM EXTERNAL SYSTEM $150



EXET-1 S & H $10.00

- Beige color
- Power command center, one master switch and four subswitches with four sockets
- Built in power supply, 65W. +12V/2.5A; +5V/6A; −12V/0.5A
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- Square notch-cut
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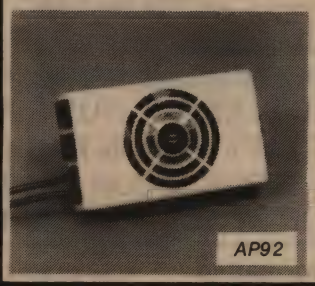


- New super-thin design
- Adjustable: fits all cases
- Dual outlets for monitor and printer
- Heavy duty switch w/power on pilot light
- Built-in power surge protection
- Also fits Commodore model 1541 drive

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- RF Modulator
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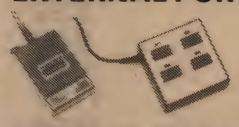

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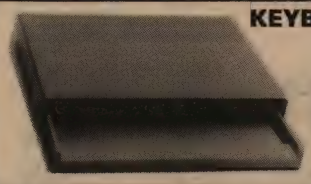

- Slides out on ball-bearing glides and locks.
- Steel platform with baked-on beige enamel finish to match your PC
- Space-saving size: 3⅝"h x 22"w x 15½"d

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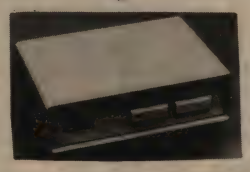

- Two position push button Centronics-style switch
- Parallel transmission
- Beige color to match your PC
- Perfect for connecting two printers to one computer or connect two computers to one printer with parallel interface
- Size: 1⅞"h x 7⅛"w x 5"d

S&H $5.00

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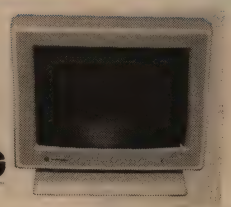

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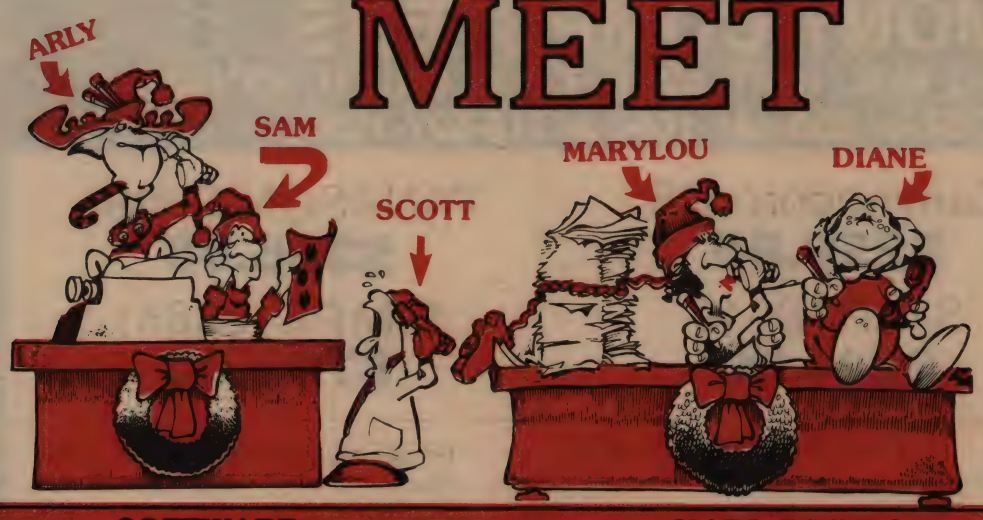


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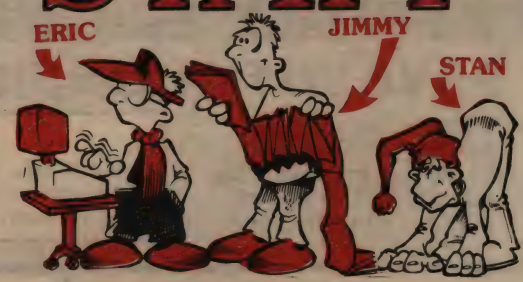


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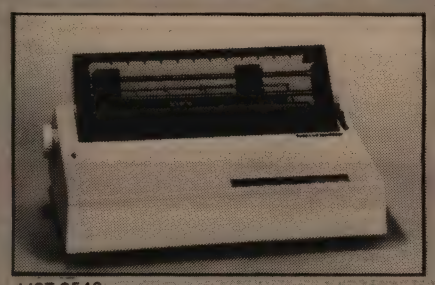

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Printout quality need not be sacrificed simply because of cost. Not only does the HR-15XL give you daisywheel printing at a price that's unbeatable, but added built-in attractions such as a 3k memory buffer (5k optional) for smoother printing and text reprinting to reproduce originals comes standard. Remarkable features such as two color printing and shadow printing gives your letters that added touch of importance. To increase the versatility of the HR-15XL, **brother** has an optional KB-50 Human Engineered typewriter keyboard to turn your HR-15XL into an electronic typewriter with automatic correction capability. Since the HR-15XL is a result of **brother's** advanced technology gained by long years of experience in the electronic office machine field it embodies such welcomed features as bi-directional 17cps printing, proportional spacing, automatic underlining, and super and sub script capability. Supplied either with Centronics parallel or RS-232C interface, the HR-15XL is compatible with most all small computers available on the market. Such options as the cut sheet feeder and tractor feeder offer further versatility to the HR-15XL — in a class way ahead of the rest.

*Our choice as the best business printer buy in the U.S. . . .*

### brother® M-1509

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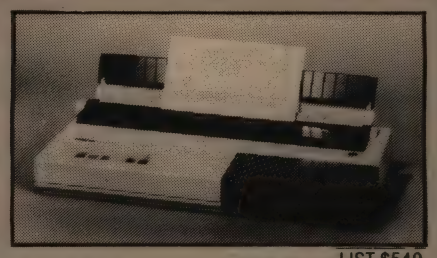

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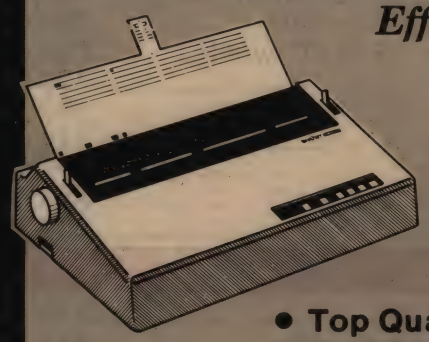
- 180 CPS
- 45 CPS In NLQ
- Wide 15.5" Paper Handling
- Epson FX and IBM Compatibility
- Both Parallel & Serial Interfaces

The **brother** M-1509 is a dot matrix printer designed to offer reliability, economy, and quiet, easy operation to users of personal or small business computers. Normal print speed is a fast 180 cps (pica), but the M-1509 also provides handsome Near Letter Quality printing at 45 cps. A variety of character sets are available, and the high-density bit image capability produces impressive graphics.

The M-1509 also incorporates a number of cost- and labor-saving features. The large memory buffer releases the computer for other tasks while printing, an optional cut sheet feeder reduces paper-handling time, and the one-inch paper cut function economizes on paper. In addition, the M-1509 is supplied with character sets and control codes compatible with those of the IBM PC and the Epson FX series printers, for easy interfacing with a broad range of computer equipment.

Above all, the M-1509 is designed for people. It is exceptionally slim and light, with conveniently consolidated controls, allowing it to fit easily into a fully-equipped work station without wasting either office space or valuable operator time. It is also quiet – a fact which, though often overlooked, is of crucial importance in maintaining an efficient, industrious office environment.

*Make Your Office Beautifully Efficient With. . .*



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- Unsurpassed Reliability

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- Handles 14.5" Paper Width
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The new Epson Spectrum LX-80 is perfect for the vast majority of your personal and professional printing needs, such as reports, term papers, recipe files or mailing lists.

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Because the LX-80 is made by Epson—the standard of the industry— it's compatible with virtually every computer system made. It inherits a reputation for dependability and durability that's unsurpassed by any other brand. And it offers a full one year warranty—the best in the business.

The new Spectrum LX-80 offers a combination of performance and value at a price that's second to none.

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*Epson continues to set the pace in computer printer performance with. . .*

**EPSON FX-85**

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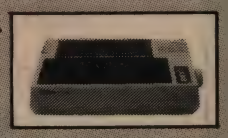

Quite simply the Epson FX-85 is the most intelligent way to print you can find. At a brisk 160 characters per second in draft mode and 32 characters per second typewriter style near letter quality mode, the FX-85 gives you professional versatility. A new 8K internal buffer stores up to 4 pages of data allowing you to print and use your computer at the same time.

Plus, for an added measure of creativity, Epson's exclusive SelecType feature gives you finger tip selection of numerous popular typestyles at the touch of a few buttons. Its easy control panel selector means less time programming when changing typestyles. The FX-85 is equipped with both pin feed and friction feed and connects to your computer by simply plugging in a cable. And with Epson's full year warranty you can be sure you're getting the most in quality, dependability and performance.

Get a hard working business printer designed to give you a powerful advantage in meeting the hectic, high-pressure demands of today's business world. . . get the FX-85!

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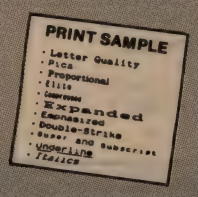
*$Call and Save$*

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**– 24 Pin – Letter Quality**

The LQ-800 and LQ-1000 can print at a speedy 180 cps printhead speed in the high speed draft mode. A speed fast enough to put a typical length business letter in your hands in under 25 seconds. Or, for a finished professional look, switch to Letter Quality mode at 60 cps. The results will amaze you. Epson's advanced new 24 pin printhead assures superb resolution page after page. In fact, print quality is so superior to that produced by other dot-matric printers, you'd think it came from a top of the line office typewriter. And for fast, efficient throughput, both print bi-directionally using intelligent, logic-seeking electronic systems. The smart way to put business on paper.

Whether you take one home, use it to help run a small to medium sized business, or use them in a corporate environment, the LQ-800 and LQ-1000 make excellent choices for virtually any printing task. You can turn out drafts at high speed, letter quality copy in seconds, or sharp, finely defined graphics. The 136 column LQ-1000 is ideal for printing spreadsheets and financial reports; while the 80 column LQ-800 can handle everything from correspondence to mailing labels. Both come with a 7K internal buffer that stores up to four pages of data allowing you to print and use your computer at the same time. Easily installed optional Identity Modules let you choose between Extended Epson Graphics, IBM Graphics Printer or Diablo 630 code. The kind of versatility a growing business demands. There are also built-in fonts and optional Font Modules for an array of easy to access font styles. The choice is yours.

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NEW **EPSON FX 286**

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The new FX-286 Dot-Matrix Printer is ideal for use at home, in the office or multi-use corporate environment. You can turn out drafts at high speed, Near Letter Quality copies in seconds and graphics of superb resolution. Standard Tractor Feed and Friction Feed accommodate virtually any type of paper; single sheet or fanfold. For optimum versatility, SelecType gives you numerous typestyles at the touch of a button. The FX-286 uses the industry standard parallel interface and has a dip switch selectable "dual identity;" Epson standard code compatibility and IBM® printer emulation. You even get build-in IBM graphics character sets for sharp resolution in graphs, charts and illustrations.

**Optimum Versatility:**
- Print drafts at high speed; Near Letter Quality copies; and superb graphics.
- An 8K internal buffer allows you to print and use your computer at the same time.
- Exclusive SelecType feature delivers numerous popular typestyles at the touch of a button.

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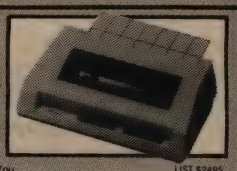

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This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

**SPECIFICATIONS**

**Carriage Width:** 132 Columns (at 10 pitch)
**Print Method:** Impact dot matrix, bidirectional, logic seeking in both text and graphics
**Print Speed:** 420 CPS/Draft, 104 CPS/Correspondence Quality, 2500 dots/sec – standard graphics, 1250 dots/sec – high-density graphics
**Print Head:** 8-pin, staggered arrangement
**Character Sets:** Standard 96 ASCII printing in 17 fonts
**Line Spacing:** n/180 (n=0-255)
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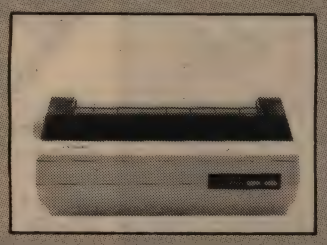
# EPSON DX- 10 Daisywheel Printer



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Capable of an array of printing tasks, the EPSON DX–10 Daisywheel Printer really comes on strong in word processing applications. It can turn out a typical business letter about three times faster than even the most nimble typist. The DX–10 is compatible with most home or office microcomputer systems on the market today, including the IBM PC and the Apple II. There is a wide variety of typestyles available using world famous Diablo interchangeable printwheels for true flexibility and total creativity. You can even get system expansion options such as a tractor feed for long printing jobs and a cut sheet feeder for aligning and inserting individual sheets of paper. And most importantly to back up EPSON'S commitment to excellence, a one year warranty comes with every DX–10 from MidWest Micro. For a dependable look you'll love on your correspondence, get the best you can buy with the EPSON DX–10 Daisywheel Printer.

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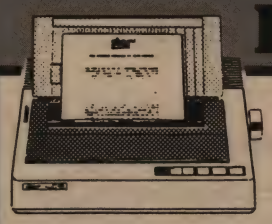

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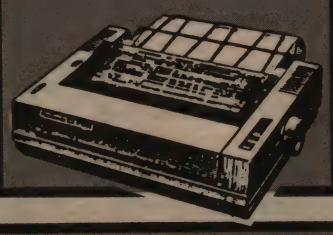

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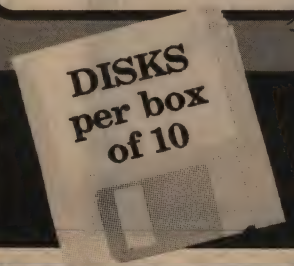


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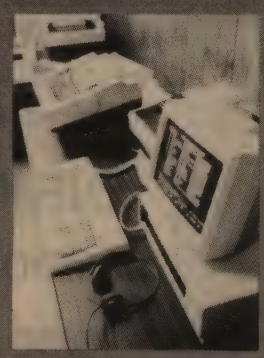

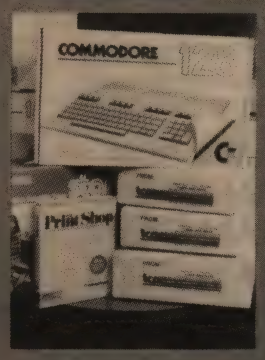

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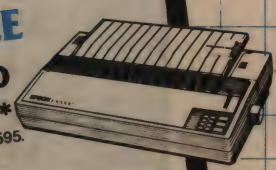

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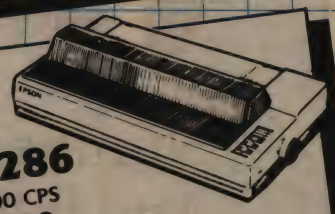

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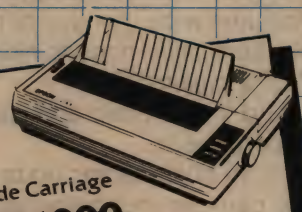

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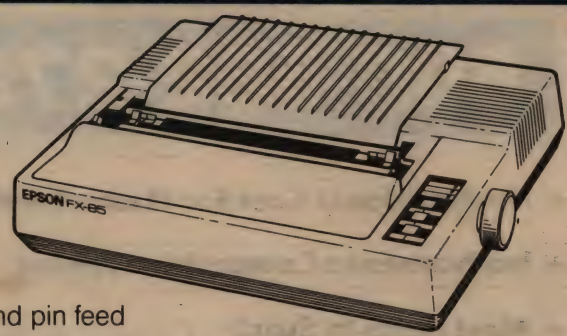

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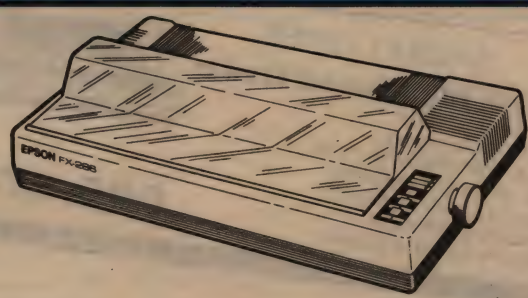

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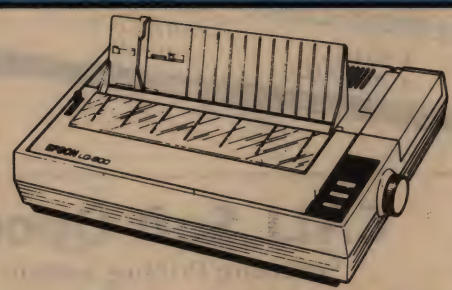

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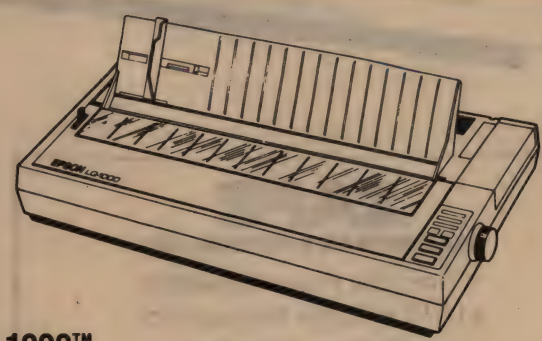

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**Word Processors continued from page 12**

mar and spelling and, when the kids are stuck for ideas, they can press a HELP key which will provide a list of themes ("The Ugliest Cat I Ever Knew") and, if they need further help, a couple of starting lines ("Last summer, I visited my cousin Mary in Oskosh. While I was there...").

PETER, PETER, PAPER EATER: We all know that computers make possible error-free finished copy, along with a foot-high stack of waste paper on the floor. Where it used to take one or two sheets per job (one for a rough draft and the second for a finished copy), it now takes 10 to 20 sheets to prepare a single-page letter. This paradox arises from the necessity to print out a separate hard copy to check each parameter: 3 or 4 copies to get the margins right, 3 or 4 to get the page-spacing right, several to get the top paper edge lined-up, and so on.

PLUME DE MA TANTE —This will be the Yuppy's favorite. It will insert a few well-turned French phrases in anything that they write, imparting a aura of smartness and insider-smugness. "Zut alors! N'est Pas! Merde!" Permits a mystifying tongue-in-cheek response to the question: "How did you write this?" User of software smiles and says: "With the feather of my aunt!"

The same architecture could be tailored for a wide variety of user categories:

JURIS would insert legal phrases, many in Latin, into attorney briefs.

BUCKLEY would add to the writer's vocabulary a choice selection of archaic words and obscure phrases taken from the works of William F. Buckley.

LUV is designed to add romantic flutter to the writing of love letters. Start any sentence, hit a Function key, and the program opens a window with a menu of suggestions on how the sentence might be improved. For example, the computer responds to the phrase "I think of you often..." with the following: 1.) You hover in my thoughts like a bird of paradise; 2.) A papable absence of the beautiful afflicts my senses; 3.) In reverie, your gentle hand rests on my arm...etc.

LUV comes with four disks graded from beginner to expert. They are appropriately named FIRST BASE, SECOND BASE, THIRD BASE, and SCORE!

LITTLE WOMEN is a word processor for porno writers. Whenever your wife or daughter (or Attorney General Meese) looks over your shoulder, you quickly press Alt-P. and the text of Lousia May Alcott's classic novel appears on the screen. If you leave the terminal for a few minutes, the Alcott front automatically comes on.

WRITE OFF, mainly for lawyers and tax consultants, is a nice little program for claiming income tax deductions. It comes with hundreds of boiler plate macros, each one calculating another tax deduction; and the software itself, is deductible.

There are a lot of good names still available, although software publishers, like manufacturers of soap and toothpaste, may try to cop some copyrights if they are not watched. I refer to such names as Scrivener, Wordmaster, MSS., Chirographer, Brachygrapher, Wordcraft, Transcribe, Scribbler, Correspondent, Amanuensis, Stenotype, Legible, Author, Gagwrite, Variwriter, Belle D'Letre, Ballpoint, Literate, etc. No doubt these will be appropriated down the road as special purpose word processors continue to proliferate.

It is my hope that these thoughts may spark some ideas from readers. Do you have some secret software functions you would like to see implemented? And, what would you name them? ●


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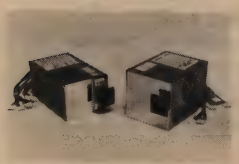

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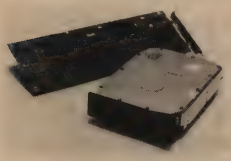

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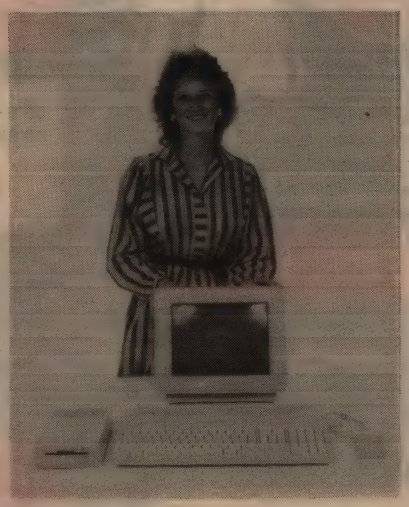

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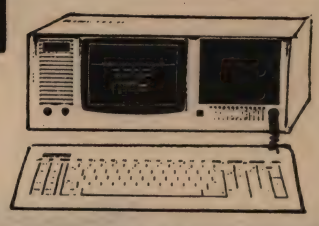

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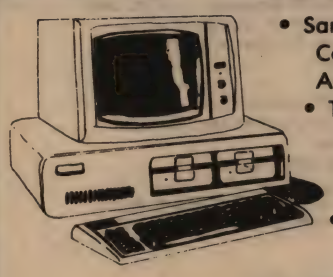

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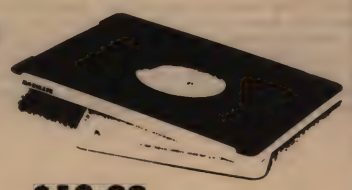

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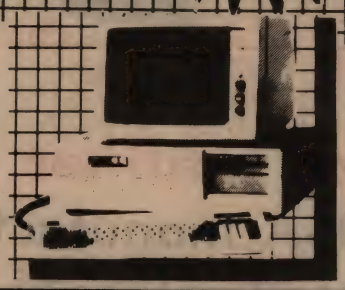

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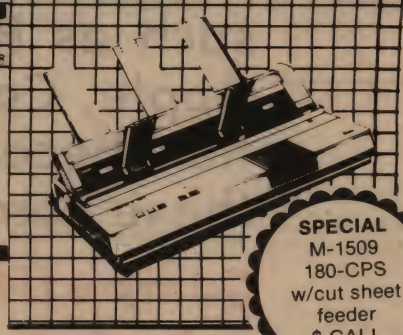

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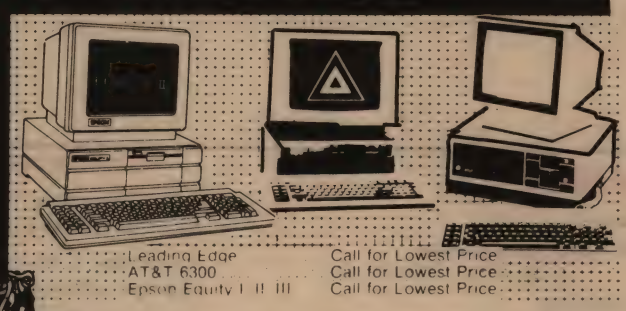

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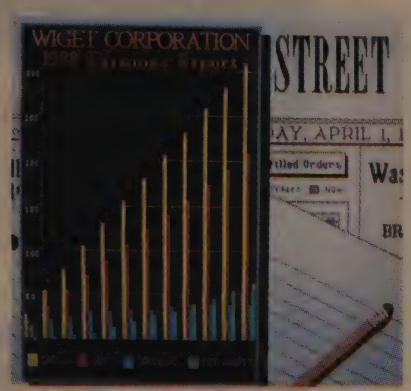


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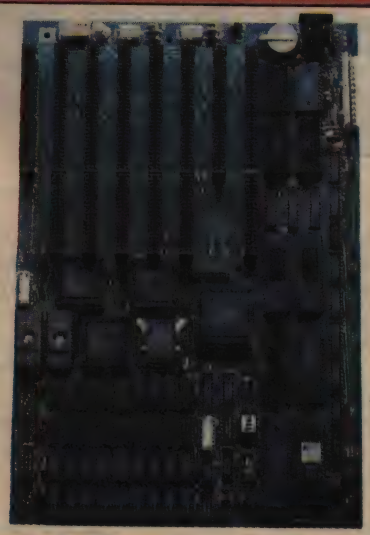

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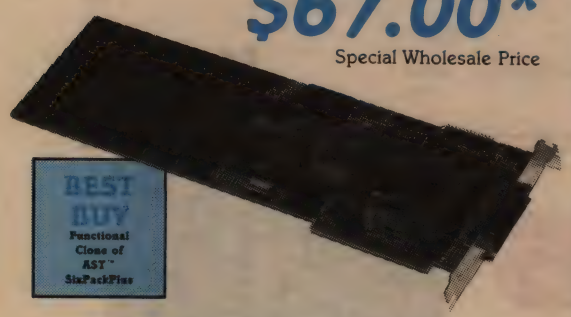


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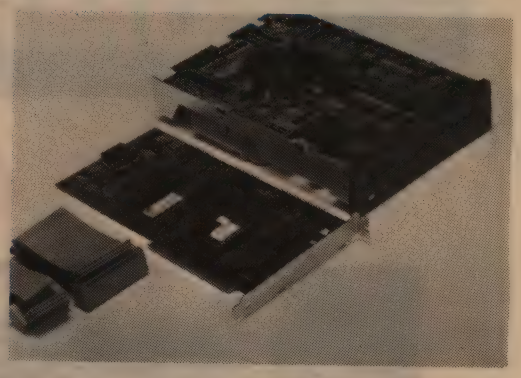

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| **Activision** *Hacker II* | 25.50* |
| **Arrays** *Home Acct/Financial Planner-Mac Only* | 69.00* |
| **Bluechip** *Baron/Millionaire/Tycoon* | 23.66* |
| **Broderbund** *Lode Runner* | 17.25* |
| **Broderbund** *Print Shop* | 24.75* |
| **Broderbund** *Dazzle Draw* | 30.25* |
| **Counterpoint** *The News Room* | 26.97* |
| **Davidson** *Speed Reader II* | 31.00* |
| **Davidson** *Math Blaster* | 21.50* |
| **Davidson** *Word Attack!* | 21.50* |
| **Edu-Ware** *Algebra 1,2,3 or 4* | 23.95* |
| **Electronic Arts** *Chessmaster 2000* | 26.97* |
| **Electronic Arts** *One on One* | 15.97* |
| **Epyx** *Temple of Apshai Trilogy, Winter Games or Summer Games II* | 20.00* |
| **1st Byte** *Smooth Talker-Mac Only* | 44.00* |
| **Harcourt Brace Jovanovich** *Comp Prep-SAT* | 47.97* |
| **Harcourt Brace Jovanovich** *Comp Prep-ACT* | 46.75* |
| **Hayden** *Sargon III* | 24.75* |
| **Infocom** *Deadline or Suspended* | 24.00* |
| **Infocom** *Enchanter, Planetfall, Trinity Cutthroats, Witness or Zork I* | 20.00* |
| **Infocom** *Hitchhiker's Guide or Seastalker* | 20.00* |
| **Infocom** *Suspect, Sorcerer or Infidel* | 22.00* |
| **Infocom** *Zork II or III* | $21.75* |
| **Microprose** *F-15 Strike Eagle, Silent Service* | 18.50* |
| **Microsoft** *Flight Simulator for the Mac* | 27.00* |
| **Miles Computing** *Mac Attack-Mac Only* | 20.50* |
| **Mindscape** *Crossword Magic, The Halley Project* | 26.50* |
| **Mindscape** *The Mist/View to a Kill/1st Blood Pt.2* | 21.00* |
| **Pinpoint Publishing** *Micro Cookbook* | 21.00* |
| **Pryority Software** *Forbidden Quest* | 21.00* |
| **Scarborough** *Master Type* | 19.75* |
| **Scarborough** *Run for the Money* | 26.00* |
| **Simon & Schuster** *Typing Tutor III* | 28.25* |
| **Sir-Tech** *Wizardry* | 26.97* |
| **Sir-Tech** *Knight of Diamonds* | 18.97* |
| ▶**Spinnaker** *Alphabet Zoo, Face Maker, Kinder Comp, Hey Diddle Diddle, Rhymes & Riddles, Story Machine* | 15.97* |
| ▶**Spinnaker** *Delta Drawing* | 24.97* |
| ▶**Spinnaker** *The Most Amazing Thing* | 20.77* |
| **Sublogic** *Jet for Apple or Mac* | 29.50* |
| **Sublogic** *Night Mission Pinball* | 20.00* |
| **Timeworks** *Evelyn Wood Dynamic Reader* | 36.00* |
| **T/Maker** *Click Art-Mac Only* | 25.00* |
| **Videx** *Mac Vegas-Mac Only* | 31.00* |

### BUSINESS SOFTWARE FOR YOUR APPLE *II* & MACINTOSH

(Please add $2.50 shipping and handling for each title ordered from below.)

| | |
|---|---|
| **Advanced Logic Systems** *Word Handler-Mac* | $52.00* |
| **Apple** *Apple Works* | 165.00* |
| **Beagle Brothers** *Macro Works* | 21.00* |
| **Borland International** *Reflex for Mac* | 59.00* |
| **Borland International** *Turbo Pascal* | 37.50* |
| **Borland International** *SideKick for Mac* | 49.85* |
| **BPI** *GL, AP, AR, PR or INV* | 205.00* |
| **Broderbund** *Bank Street Writer* | 35.25* |
| **Central Point** *Copy II Plus or Copy II Mac* | 16.25* |
| **Funk Software** *Sideways Pro Dos Ver.* | 32.00* |
| **Haba** *Habadex* | 40.00* |
| **Harvard** *Mac Manager* | 29.95* |
| **Human Edge** *Mind Prober* | 21.00* |
| **Human Edge** *Sales Edge* | 45.00* |
| ▶**Human Edge** *Communication Edge* | 98.00* |
| **Layered** *Notes for Jazz or Excel* | 186.00* |
| ▶**Living Videotext** *ThinkTank-Mac Tool* | 65.00* |
| **MECA** *Managing Your Money* | 99.00* |
| ▶**Microsoft** *Word for Macintosh* | $97.50* |
| ▶**Microsoft** *File for Macintosh* | 97.50* |
| ▶**Microsoft** *Multiplan for Macintosh* | 97.50* |
| **Microsoft** *Basic for Macintosh* | 75.00* |
| **Microsoft** *Chart for Macintosh* | 62.50* |
| **Monogram** *Dollars & Sense for Apple II* | 71.99* |
| **Monogram** *Dollars & Sense for Macintosh* | 63.00* |
| **Odesta** *Helix for Macintosh Reg's 512K* | 195.00* |
| **Provue** *Overvue-Mac Only* | 145.00* |
| **Sensible Software** *Sensible Speller IV* | 67.50* |
| **Sierra On Line** *Mac One Write Module* | 69.00* |
| **Softech Microsystems** *UCSD Pascal* | 37.00* |
| **Software Publishing** *File and Report Bundle* | 68.00* |
| **Software Publishing** *Write, or Graph* | 68.00* |
| **Stoneware** *DB Master-Mac Too!* | 90.00* |
| **Telos** *Filevision for Mac* | 85.00* |
| **True Basic Inc** *True Basic for Mac* | 79.00* |

### HARDWARE FOR YOUR APPLE *II* & MACINTOSH

(Please add shipping and handling charges found in italics next to price.)

#### DISK DRIVES

| | Wholesale | |
|---|---|---|
| **Apple** *All Models* | CALL | |
| ▶**Apple** *MAC 800KB External Drive* | $283.95* | (6.14) |
| **AST** *2000 Mac 20/20 20MB SCSI HD w/20MB Tape Backup* | 1,885.00* | (40.72) |
| **IOmega** *20MB SCSI Bernoulli Box for Mac* | 2,199.00* | (47.50) |
| **IOmega** *10MB SCSI Bernoulli Box for Mac* | 1,700.00* | (36.72) |
| **IOmega** *Macnoulli 5MB Removable Drive for Macintosh* | 999.00* | (21.58) |
| ▶**Paradise** *Mac 10MB Hard Drive* | 525.00* | (16.20) |
| ▶**Paradise** *Mac 20MB Hard Drive* | 745.00* | (20.25) |
| ▶**PC Network** *140K External Drive for Apple IIc* | 95.00* | (2.50) |
| **PC Network** *140K Full Height Drive for Apple IIe* | 95.00* | (2.50) |
| **PC Network** *800KB DS/DD Mac Drive* | 185.00* | (4.00) |
| **DC Systems** *Easy Drive 20MB SCSI* | 650.00* | (14.04) |

#### BOARDS AND BUFFERS

| | | |
|---|---|---|
| **Advanced Logic Systems** *AdRAM 80 COL Card w/256K* | $124.00* | (2.50) |
| **AST** *Megaramplus w/64K of 1MB* | 120.00* | (2.59) |
| **AST**™ *Multil/O—2 Serial/Clock* | 155.00* | (2.50) |
| **Microsoft** *Premium Softcard IIe* | 243.67* | (2.50) |
| **Microtek** *Dumpling/GX* | 55.00* | (2.50) |
| **Orange Micro** *Grappler +* | 66.00* | (2.50) |
| **Orange Micro** *Serial Grappler* | 66.00* | (2.50) |
| **PC Network** *Z80 Card* | 35.00* | (2.50) |
| **Quadram** *APIC/G Graphics Interface* | 62.00* | (2.50) |
| **Quadram** *E RAM-80* | 88.00* | (2.50) |
| **Quadram** *Multicore—1 Parallel 1 Serial/Clock Expandable to 256K* | 140.00* | (2.50) |
| **Titan Technologies** *Accelerator IIe* | 207.35* | (4.47) |

#### MODEMS

| | Wholesale | |
|---|---|---|
| **Hayes** *Micromodem IIe w/Smartcom* | $125.00* | (2.50) |
| **Novation** *Apple Cat II* | 174.45* | (3.50) |
| **Prometheus** *1200 A Low Cost 1200 Baud Internal Modem for Apple II.* | 225.00* | (4.86) |
| **Prometheus** *Promodem 1200* | 253.00* | (5.46) |
| **Prentice** *Popcom, MacPack, 1200 Baud Modem, Cable, Straightalk* | 219.00* | (2.50) |

#### ACCESSORIES

| | | |
|---|---|---|
| **Apple** *Macintosh Security Kit* | 29.00* | (1.50) |
| **Curtis** *Diamond Surge Protector* | $23.50* | (1.00) |
| **Curtis** *Ruby Surge Protector* | 39.00* | (1.50) |
| **Hayes** *Mach III Joystick w/Fire Button for IIe* | 26.50* | (1.50) |
| **Kensington** *Disk Case* | 20.00* | (1.50) |
| **Kensington** *Dust Cover for MAC or ImageWriter* | 7.50* | (1.50) |
| **Kensington** *Starter Pack* | 49.00* | (3.00) |
| ▶**Kensington** *Surge Protector* | 27.75* | (2.50) |
| **Kensington** *System Saver Fan* | 56.97* | (1.50) |
| ▶**Koala** *MacVision* | 150.00* | (3.00) |
| **Koala** *Koalapad Touch Tablet* | 78.00* | (1.50) |
| **PC Network** *Cooling Fan with Surge Protector & Dual Outlets* | 25.00* | (2.50) |
| **PC Network** *SSDD Diskettes (Box of 10)* | 6.95* | (1.00) |
| **PC Network** *Macintosh Diskettes Includes Free Flip & File Case These Diskettes are Guaranteed for Life! No Generics!* | 12.50* | (1.50) |
| **PTI** *Datashield S85* | 45.00* | (1.00) |
| **Sony** *31/2" DS/DD Diskettes* | 19.00* | (1.50) |
| **Thunderware** *Thunderscan* | 155.00* | (3.25) |

### GAMES & EDUCATIONAL SOFTWARE FOR YOUR IBM

(Please add $1 shipping and handling for each title ordered from below.)

| | Wholesale |
|---|---|
| ▶**ATI** *Intro to PC DOS Vol. I & II* | $27.60* |
| **ATI** *Intro to BASIC* | 23.00* |
| **Bluechip** *Millionaire/Oil Baron or Tycoon* | 28.99* |
| **Broderbund** *Ancient Art of War* | 22.75* |
| **Broderbund** *Lode Runner* | 17.25* |
| **Davidson** *Math Blaster, Word Attack!* | 21.50* |
| **Davidson** *Speed Reader II* | 36.00* |
| **Electronic Arts** *One On One* | 19.97* |
| **Epyx** *Winter Games, Summer Games II or Temple of Apshai Trilogy* | 20.00* |
| **Hayden** *Sargon III* | 26.00* |
| **Individual** *Professor DOS* | 29.75* |
| **Individual** *The Instructor* | 24.50* |
| ▶**Infocom** *Zork I, Witness or Trinity* | 19.75* |
| ▶**Infocom** *Deadline or Suspended* | 24.00* |
| **Microsoft** *Flight Simulator* | 27.00* |
| **Mindscape** *First Blood Part 2, The Mist or A View to a Kill* | $21.00* |
| **Mouse Systems** *PC Paint—Turn your PC Into A Color Macintosh!* | 59.95* |
| **Pinpoint Publishing** *Micro Cookbook* | 21.00* |
| **Scarborough** *Master Type* | 19.75* |
| **Sierra On-Line** *King's Quest II* | 24.75* |
| **Spectrum Holobyte** *GATO* | 18.00* |
| ▶**Spinnaker** *Alphabet Zoo,Kinder Comp. Story Machine, Face Maker, Hey Diddle Diddle, Rhymes & Riddles* | 15.97* |
| ▶**Spinnaker** *Delta Drawing* | 20.75* |
| ▶**Spinnaker** *Most Amazing Thing* | 20.77* |
| **Sublogic** *Jet* | 27.50* |
| **Sublogic** *Night Mission Pinball* | 20.00* |
| **Timeworks** *Evelyn Wood Dynamic Reader* | 41.00* |

### BUSINESS SOFTWARE FOR YOUR IBM

(Please add $2.50 shipping and handling for each title ordered from below.)

| | |
|---|---|
| ▶**Ashton-Tate** *DBase III+* | $365.00* |
| ▶**Ashton-Tate** *Framework II* | 365.00* |
| **ANSA** *Paradox* | 445.00* |
| **Borland** *Reflex* | 54.00* |
| **Borland** *Turbo Pascal* | 35.00* |
| **Borland** *SideKick (Unprotected)* | 42.00* |
| **Borland** *Turbo Pascal 8087* | 49.75* |
| **Borland** *SuperKey* | 34.50* |
| ▶**BPI** *G/L, A/R or A/P* | 275.00* |
| **Breakthrough** *Timeline Ver. 2.0* | 203.00* |
| ▶**Central Point** *Copy II PC* | 20.00* |
| **Computer Associates** *Supercalc 4* | 239.95* |
| ▶**Computer Associates** *Super Project Plus* | 239.95* |
| **Conceptual Instruments** *Desk Organizer* | 47.00* |
| **Enertronics** *Energraphics 2.0* | 280.00* |
| **Funk Software** *Sideways* | 32.00* |
| **Harvard** *Total Project Manager* | 250.00* |
| ▶**Hayes** *Smartcom II—New VT100 Emulator* | 78.00* |
| ▶**Human Edge** *Mind Prober* | 24.00* |
| ▶**Infocom** *Cornerstone* | 65.00* |
| **Lifetree** *Volkswriter III* | 126.50* |
| **Living Videotext** *Think Tank* | 87.00* |
| ▶**Lotus Development** *Lotus 1-2-3 Ver. 2.01* | 285.00* |
| ▶**Lotus Development** *Symphony* | 385.00* |
| **MDBS** *Knowledgeman/2* | 229.00* |
| **Meca** *Managing Your Money* | 92.00* |
| **MicroPro** *Wordstar 2000* | $210.00* |
| **MicroPro** *Wordstar 2000+* | 259.00* |
| ▶**MicroRim** *RBase System* | 339.00* |
| **MicroRim** *RBase 5000* | 215.00* |
| **Microsoft** *C Complier* | 230.00* |
| **Microsoft** *Word—Latest Version 3.0* | 229.00* |
| **Microsoft** *Multiplan* | 98.00* |
| **Microsoft** *Mouse* | 107.00* |
| **Migent** *Ability* | 55.00* |
| ▶**Monogram** *Dollars & Sense* | 85.00* |
| **Multimate** *Advantage* | 270.00* |
| ▶**Multimate** *Multimate (Latest Version)* | 190.00* |
| **Nantucket Clipper** *DBase III Compiler* | 350.00* |
| ▶**Norton** *The Norton Commander* | 36.00* |
| **Norton** *Norton Utilities 3.1* | 43.00* |
| **Open Systems** *P/O Sales A/R INV G/L A/P Ver. 3X* | ea.395.00* |
| **Power Base** *Power Base* | 200.00* |
| **Rosesoft** *ProKey Version 4.0* | 65.00* |
| **Ryan McFarland** *RM COBOL (Dev. System)* | 520.00* |
| ▶**Samna** *Samna III Word Processor* | 236.00* |
| ▶**Satelite Software** *Word Perfect 4.1* | 185.00* |
| **Software Publishing** *PFS:File, Write, Graph* | 68.00* |
| **Software Publishing** *PFS:Report* | 64.00* |
| **Software Publishing** *PFS: Prof. File* | 132.00* |
| **Software Publishing** *PFS: Prof. File, Write* | 105.00* |

### HARDWARE FOR YOUR IBM

(Please add shipping and handling charges found in italics next to price.)

#### DISK DRIVES

| | Wholesale | |
|---|---|---|
| **IOmega** *Bernoulli Box Dual 10MB Drives* | $1,710.00* | (36.94) |
| **PC Network** *AT 42MB Internal HD 35MS Access Time—Comes Complete* | 1,050.00* | (22.68) |
| **PC Network** *20MB Tape Backup Half Height Internal w/Controller* | 520.00* | (10.69) |
| ▶**PC Network** *10MB INTERNAL 1/2 Height Autoboot Drive: New lower price* | 289.00* | (7.34) |
| **PC Network** *10MB Tape Backup Same unit used in Compaq's DeskPro!* | 395.00* | (8.94) |
| ▶**PC Network** *Half Height DS/DD Drives* | 75.00* | (1.68) |
| ▶**THE 20 + 20** *20MB Hard Disk and 20MB Tape Backup Combo Kit* | 699.00* | (15.88) |
| **THE** *20MB INTERNAL 1/2 Height Hard Drive by Seagate or Microscience* | 357.00* | (7.93) |

#### MULTIFUNCTION CARDS

| | | |
|---|---|---|
| **AST**™ *Advantage for AT*™ | $325.00* | (2.50) |
| **AST** *I/O Mini IS,IP,CLK-CAL* | 107.00* | (2.50) |
| **AST** *SixPakPremium*™*2MB/* | 315.00* | (2.50) |
| ▶**AST** *SixPakPlus*™*with 64K* | 139.00* | (2.50) |
| ▶**Orchid** *Conquest w/0K 2MB EMS* | 220.00* | (2.50) |
| **Orchid**™ *Tiny Turbo 286 Shortslot*™ | 399.00* | (8.62) |
| **Quadram** *Gold Card 384K Multifunction/Color Card w/0K* | 340.00* | (2.50) |
| **Tecmar** *Captain Multi Card w/0K* | 109.00* | (2.50) |
| ▶**THE**™**576K Plus** *Memory Board/0K* | 35.00* | (2.50) |
| ▶**THE**™**Multi 384** *A functional clone of AST's*™*SixPakPlus.*™ *Includes up to 384K of expansion memory, 1 serial, 1 parallel, 1 game port, a clock/calendar and 3 software standard.* | 67.00* | (2.50) |
| ▶**THE**™**Multi I/O** *I/O Plus II Clone Ser/Par/Game/Clock standard* | 60.00* | (2.50) |

#### MODEMS

| | Wholesale | |
|---|---|---|
| **Anchor** *Lightning I 2400 Baud 1/2 Card* | $282.00* | (2.50) |
| **Hayes** *Smartmodem 1200B with New Smartcom II/VT100 Emulator* | 315.00* | (2.50) |
| **Hayes** *Smartmodem 2400B* | 478.00* | (2.50) |
| **Prometheus** *Promodem 1200B* | 225.00* | (2.50) |
| **THE**™ *Internal 1200 BPS Modem* | 109.00* | (2.50) |
| **THE**™ *Internal 2400 BPS Modem* | 197.00* | (2.50) |

#### VIDEO CARDS

| | | |
|---|---|---|
| **Hercules** *Color Card w/Parallel Port* | $126.00* | (2.50) |
| ▶**Hercules** *Mono Graphics Card* | 162.00* | (2.50) |
| ▶**Orchid** *Turbo EGA* | 569.00* | (2.50) |
| **Paradise** *Autoswitch EGA* | 336.00* | (2.50) |
| **Quadram** *Quad EGA + Enhanced Graphics Adapter* | 323.00* | (2.50) |
| ▶**THE**™**H720** *Mono Card Clone 100% Hercules Compatible!* | 69.00* | (2.50) |
| ▶**THE**™**ColorCard** *100% IBM Compatible* | 60.00* | (2.50) |
| ▶**THE**™**EGA Plus** *EGA Clone* | 220.00* | (2.50) |

#### ACCESSORIES

| | | |
|---|---|---|
| ▶**Brand Name DS/DD Diskettes** *Guaranteed for Life! Not Generic!* | $ 7.95* | (1.00) |
| ▶**DS/DD Bulk Rate Special** *Packaged in 50 with sleeves and labels Guaranteed for Life!* | .44*ea. | |
| ▶**PC Network** *Replacement 130 Watt IBM-PC Power Supply—Gives your PC the same Capacity as an XT. Good for add in Tape Drives (without the need for a piggyback unit) and large capacity disk drives.* | 70.00* | (5.00) |
| **SMA** *PC Documate: Keyboard Templates for Lotus/DBase/Multimate and others* | 9.99* | (1.00) |

### MEMORY CHIPS

(All Memory Chips Guaranteed for Life!)

| | Wholesale | |
|---|---|---|
| ▶**64K Memory Upgrade Kits** *(9 Chips) Quantity Discounts Available!* | $9.00* | (1.00) |
| ▶**64K Dynamic Ram Chips** *(Each)* | 1.00* | (1.00) |
| ▶**256K Dynamic Ram Chips** *(Each)* | 2.90* | (1.00) |
| ▶**128K IBM AT Mother Board Chips** | 3.50* | (1.00) |

### EXTERNAL MODEMS

| | | |
|---|---|---|
| **Anchor** *Signalman Express* | $205.00* | (5.00) |
| **Hayes** *Smartmodem 1200* | 340.00* | (5.00) |
| ▶**Hayes** *Smartmodem 2400* | 525.00* | (5.00) |
| **Prometheus** *Promodem 1200* | 247.00* | (6.00) |
| **ALL THE**™**MODEMS ARE 100% HAYES COMPATIBLE** | | |
| **THE**™ *1200 COM External Modem* | 119.00* | (2.50) |
| **THE**™ *2400 COM External Modem* | 259.00* | (3.00) |
| ▶**U.S. Robotics** *Courier 2400BPS* | 345.00* | (5.00) |
| ▶**U.S. Robotics** *Password* | 172.00* | (4.00) |

### MONITORS

| | Wholesale | |
|---|---|---|
| **Amdek** *Video 300G Green* | $110.00* | (3.00) |
| **Amdek** *Video 300A Amber* | 120.00* | (3.00) |
| **Amdek** *Video 310A IBM Type Amber* | 130.00* | (3.00) |
| **Amdek** *Color 600 High Res RGB* | 365.00* | (7.88) |
| **Amdek** *Color722 Enhanced Graphics* | 424.00* | (9.16) |
| ▶**Magnavox** *12" TTL IBM Type Monitor* | 79.00* | (5.00) |
| ▶**Magnavox** *14" RGB Color 640x240* | 250.00* | (5.94) |
| **NEC** *JC-1401 Multisync RGB* | 530.00* | (10.37) |
| **Princeton** *HX-12 RGB Monitor* | 369.00* | (7.97) |
| **Princeton** *Max 12e Works with Color or Mono Card* | 138.00* | (5.00) |
| **Quadram** *ED 13" Enhanced Graphics* | 430.00* | (9.28) |
| **Taxan** *121 12" TTL Green Monitor* | 120.00* | (2.59) |
| **Taxan** *630 High Res RGB Monitor* | 383.00* | (8.27) |
| **Taxan** *640 Highest Res (720 x400) Currently Available—Works with Persyst BOB Card* | 439.00* | (10.69) |
| **Zenith** *ZVM-1230A Green High Res/Non Glare* | 91.00* | (2.50) |

### COMPLETE SYSTEMS

| | | |
|---|---|---|
| **Apple** *Macintosh Base System* | CALL | |
| **AT&T** *6300PC CPU 640K 2 Floppy/1 Serial/1 Parallel/Green Monitor* | $1,775.00* | (38.34) |
| **Central Point** *Laser 128 Computer Apple IIc Compatible* | 355.00* | (7.67) |
| ▶**COMPAQ** *DeskPro w/640K 1 Floppy/20MB Hard Disk* | 1775.00* | (41.26) |
| ▶**COMPAQ** *Hard Disk Portable 20MB Hard Disk/1 Floppy* | $1,800.00* | (41.26) |
| ▶**IBM** *PC Base System 256K* | 1,025.00* | (22.14) |
| ▶**IBM** *PC Professional Hard Disk* | 1,337.00* | (30.07) |
| ▶**IBM** *PC/AT Base System 1.2MB Floppy w/256K* | 2,204.00* | (62.10) |
| **IBM** *AT Professional System 1.2MB Floppy/20MB Hard Disk/1 Ser/Par/512K* | CALL | |

### PRINTERS

| | | |
|---|---|---|
| ▶**Citizen** *MSP-10 NEW! 160CPS/80COL/Fric + Trac* | $259.00* | (4.68) |
| ▶**Citizen** *MSP-15 NEW! 160CPS/132COL/Fric + Trac* | 340.00* | (7.34) |
| ▶**Citizen** *MSP-20 NEW! 200CPS/80COL/Fric + Trac* | 299.00* | (6.46) |
| ▶**Citizen** *MSP-25 NEW! 200CPS/132COL/Fric + Trac* | 435.00* | (9.40) |
| ▶**Citizen** *Premiere 35 NEW! 35 CPS Daisywheel/132COL/Fric + Trac* | 420.00* | (9.07) |
| **Citizen** *120-D 120/125CPS 10" Trac Friction Feed w/NLQ Switch* | 169.00* | (3.63) |
| **Epson** *DX 35 35CPS/LQ Model* | 590.00* | (12.74) |
| **Epson** *EX-800 300/60CPS 80COL Par/Ser* | 445.00* | (9.61) |
| **Epson** *EX-1000 300/60CPS 132COL Par/Ser* | 629.00* | (13.59) |
| ▶**Epson** *FX-85* | 345.00* | (7.45) |
| ▶**Epson** *FX-286 NEW!* | 505.00* | (10.91) |
| **Epson** *LQ-800 180/60CPS/COL Par* | 519.00* | (11.21) |
| **Epson** *LQ1000 180CPS/60CPS NLQ* | 699.00* | (15.09) |
| ▶**Epson** *LX-86 120/16CPS 8.5" Par* | $219.00* | (4.73) |
| ▶**Epson** *LX-86 120CPS/8.5"/Parallel* | 219.00* | (4.35) |
| ▶**NEC** *Pinwriter P7216/180/65 10"* | 565.00* | (12.20) |
| ▶**NEC** *2050 20CPS Letter Quality* | 570.00* | (13.00) |
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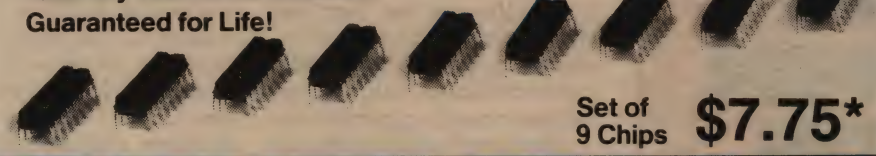

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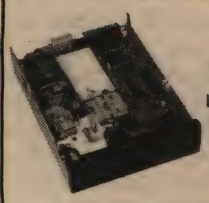

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**Tales of Horror continued from page 14**

keeping options open.

**Trap 2: The Fable of Terminal Chafe**

Dick has sidestepped the pitfall of the single-notch belt by carefully installing a flexible system that can grow with his business. It is a powerful one, since he decided to automate everything at once. A central, or "host" mini is hooked up to five terminals: Three handle accounts receivable/payable; two are used by the administrative staff for word processing and database management. Dick has his unwieldy mailing list maintained by a lessor on an offsite mainframe. To round out the arrangement, he buys four desktop micros: one for his desk, one for another manager, and two for his salespeople.

Operation Automation proceeds smoothly. Accounts receivable/payable are updated daily; the mailing list stays fresh and can be manipulated in many ways; much office correspondence begins from "boilerplate" letter formats; subcontractor information, target dates and costs are always at hand; and each manager has powerful tools to organize and expedite tasks. The system can also accommodate new terminals or micros whenever necessary without disturbing the workflow.

So what's wrong with this picture? Well, over time a new set of problems crops up. The location of memoranda, correspondence and contracts is known only to Dick's support staff. Only accounts receivable/payable actually knows the current state of accounts receivable/payable. Though each manager contols his or her responsibilities via computer, Dick's machines work in isolation from one another. The sales force makes good use of client and potential client databases, but each of their machines contains entirely different information. The salespeople are also frequently "out in the field," leaving their computers dormant. When they return, they are faced with the task of heavy updating. To top it all off, keeping tabs on Dick's mailing list means contacting the lessor by mail or phone—as archaic a communication system as any that has existed over the last 50 years.

This is "terminal chafe," one of the most insidious pitfalls inherent in office automation. Each element of the system seems an island unto itself, unable to account to any of the other parts of that system—even those right alongside it. This happens whenever one type of system comes up against another—and rubs it the wrong way—because they speak in different tongues and can't share information. Resolving these differences often requires a throwback to doing things the old way. You remember the old way, don't you? Blizzards of paper, missed telephone calls, duplicated duplicating...

*Moral:* If data needs to be shared between departments, or even among people in the same department, then data needs to be shared by the systems they use, too. Terminal chafe can magnify areas of inefficiency, and without a solid communications link, you risk not less but more paper pile up, duplicated effort and confusion than you had *before* you brought in high tech hardware to make everything wonderful.

*Avoiding Dick's Fate*: Determine what types of information are shared among departments in your office before you automate; if a lot of information is funneled from one department to another, make sure that communication among their computer systems is part of the contract you develop with your consultant or dealer. This can include computers already on the premises, since all computers can be made to communicate via some combination of telecommunications software and a hardware link-up that acts as an interface between them. If the computers are close together (such as all in one room), you probably will find that they can be connected serially to one another much as they are connected printers or disk drives. If they are in different buildings—or even different hemispheres—they can be made to communicate using the telephone lines and a piece of hardware known as the modem. Computers can chat over the phone almost as easily as human beings can; but they need very clean lines to transmit information garble-free, and they may hog the phone unless they have their own lines. Check out internal telephone-line options at the time you invest in your computer system. Otherwise you may get caught with your ceiling tiles down at an inopportune moment and risk not only having dust drop into your machines but a plethora of wires reminding you once again of Babel.

Depending on how different the machines are in your office, the amount and kind of communication that's possible between them will vary. In almost every case, straight text can be moved to and fro without much problem. Between computers of a similar type (such as IBM and IBM compatibles), spreadsheet and database information—and even graphics—can be transferred, provided the same type of software is available at both ends to make the transferred material meaningful. For incompatible micros, such as IBM to Macintosh, moving information from databases or spreadsheets gets more complicated. Hence, the golden rule: *Whenever you have the option, buy computers that are the same make or compatible.*

When you or your salespeople are on the road, a portable computer with a built-in modem can be useful to keep in touch with and update home base. Just call your office directly and transfer reports, messages and other data over the phone lines to someone on the other end. Or, to beat time-zone discrepencies from coast to coast, you can use post office-like facilities offered by commercial networks such as MCI or CompuServe to "drop off" information whenever you feel like it—and it will wait there until someone in your office can "pick it up" with their computer. Phone calls are made to be missed, but electronic mail is always there and can even be used to keep office files current so there's no need for later updating.

**Trap 3: The Heartbreak of Elephantiasis**

All the departments under Tom's aegis are equipped with computers, but each has machines of a different type and age, and the fact that they can't communicate is driving Tom's staff (not to mention Tom) over the edge. By hook or by crook, he manages to get most of them communicating, at least after a fashion. A call to his local dealer (probably

**continued on page 317**

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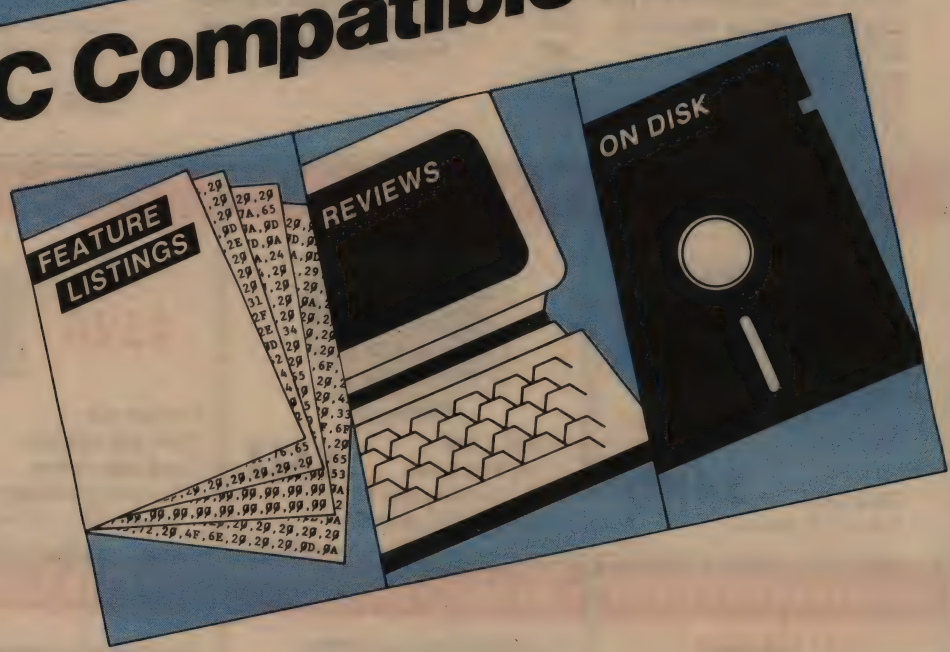


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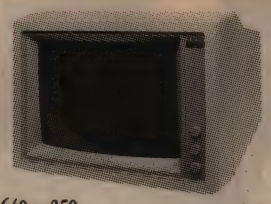

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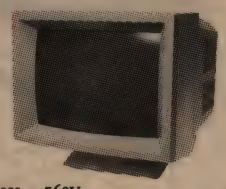

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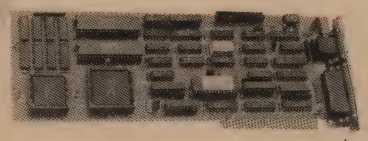

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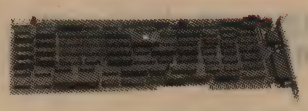

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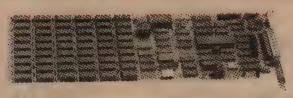

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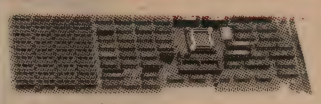

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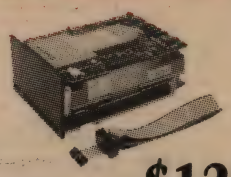

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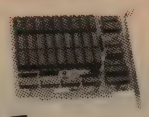

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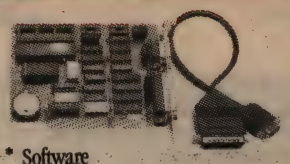

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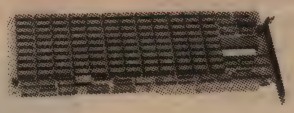


- No Piggy back
- 0-3 MB capacity
- 64k/256K RAM chips
- One Year Limited Warranty
- FCC class 'B' approval

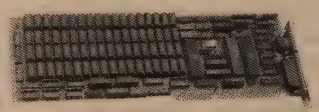
Made in U.S.A.

**CLUB 3000** **$155**

## AT-MULTIFUNCTION CARD

**Manager's Choice**

**$179**



- Game port
- 0-2MB Memory
- Runs at 12 MHZ
- 128K Increment range
- 2 Serial port (1 option)
- Self Installing software

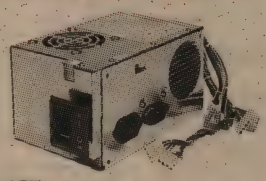
**12MHZ AT-Multifunction**
**Made in U.S.A.**

## FLOPPY DISK DRIVE

- 360K
- Half height
- TEAC/FUJITSU
- Double density
- IBM grey color extra

**$89**

## XT POWER SUPPLY



- 135W
- Reliable
- Complies with FCC
- Direct replacement
- One Year Limited Warranty

**$83**

## MOUSE

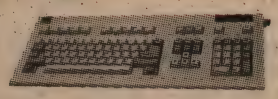
**Microsoft Compatible**

- 200 Dots/inch
- Work with Auto-Cad
- 3 Buttons/built in Microprocessor

**$75**

Mouse with DR. HALO **$109**

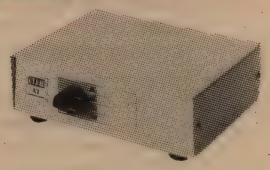
## PRO KEYBOARD



**5151** **$88**

- Separate Numeric & Curser keypad
- AT Style Keyboard w/LED

## SWITCH MASTER

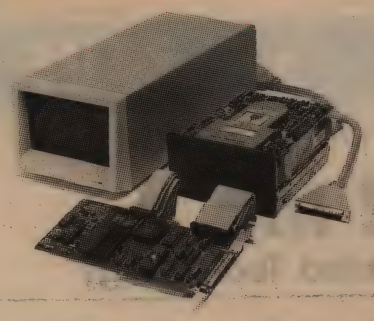


- Cable included
- Printer Spooler for IBM
- Share one printer by 4 computer or 1 computer to 4 printer

**$88**

## FAST HARD DISK FOR PC/XT AND COMPATIBLE

***Upgrade Your PC/XT***
***Power Your XT***

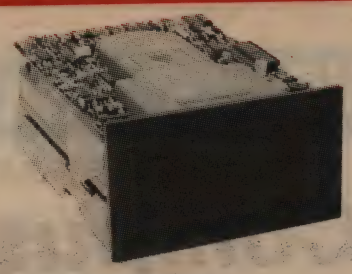


**39 ms Access time**

- Auto Head Park
- Boot from Hard disk
- Quality Seagate drive
- 39 ms average access time
- Software and Manual included
- Special Western Digital controller

| | INTERNAL | EXTERNAL |
|---|---|---|
| ◻ 20MB Hard Disk Subsystem Seagate 4026 | $659 | $759 |
| ◻ 30MB Hard Disk Subsystem Seagate 4038 | $759 | $859 |
| ◻ 40MB Hard Disk Subsystem Seagate (available now) | $859 | $959 |

## FAST AT HARD DISK DRIVE



**39 ms Access time**

- 39 ms access time
- Auto Head Parking
- Linear Voice Coil Activator
- One Year Limited Warranty
- Cables, AT sliding rail and Software included

| | |
|---|---|
| 20MB 4026 | $528 |
| 30MB 4038 | $628 |
| 40MB 4051 | $699 |
| 72MB (23 ms) | $1195 |
| 80MB 4096 (28 ms) | $1295 |

## EVEREX MODEM—HAYES COMPATIBLE

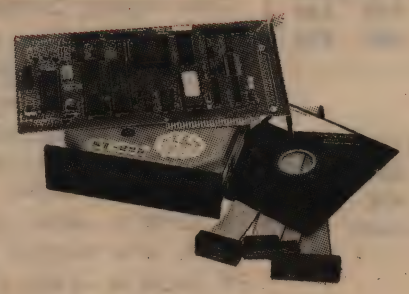
Made in U.S.A. *FCC class 'B' approval

- 300/1200 Baud
- Half size/Half power
- One Year Limited Warranty
- Excellent for Long Distance calls
- Free Bitcom Communication Software

***2400 Baud** **CALL**

**$128**

## 20/30 HARD DISK SUBSYSTEM



***For PC Upgrade to XT***

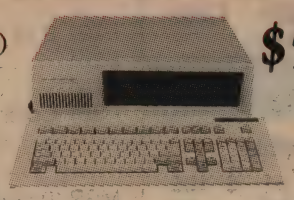
| | *INTERNAL* | *EXTERNAL* |
|---|---|---|
| 20MB | $375 | $567 |
| 30MB | $475 | |

- 65MS access time
- Boots from Hard Disk
- Western Digital Controller
- Manual, Cables, Hardware and Software included
- 20/30MB Seagate Hard Disk

**With Floppy Controller Add $50**

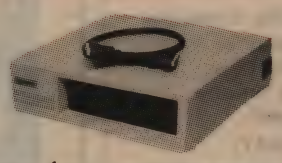
## CLUB XT TURBO 4.77/8.0 MHZ

- 360K Floppy Drive
- 135W Power supply
- Color: PC/XT Color
- Electrical: 115V220V
- 8088 CPU, 4.77 MHZ
- Legal Compatible BIOS
- Floppy Disk Controller
- 8087 Math Co-processor (option)
- Dimension: 17.5 x 19 x 6.1
- 640K Memory 765K Standard
- *One Year Limited Warranty
- *Quanity discounts available



**$505**

## EXPANSION CHASSIS



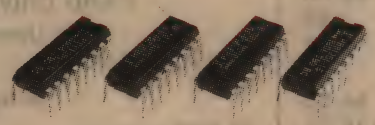
- 8 expansion slots
- No wait state design
- Round shielded cable
- 4 half height drive space
- Most compatible chassis on the market

**$428**

## WEEKLY SPECIALS

| | *Qty. of 2* |
|---|---|
| ***Toshiba 72MB*** | **$1099** |
| ***Seagate 4051*** | **$638** |
| ***Teac Floppy 360K*** | **$85** |

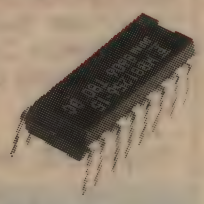
## 64K DRAM



150 ns (9 pcs.)

**$9**

## 256K RAM



150 ns (9 pcs.)
120 ns (add $9.00)

**$27**

## OTHERS

***HARD DISK CONTROLLERS***

| | |
|---|---|
| * Data Switch Box | *$68* |
| * PC/XT controller | *$90* |
| * Floppy controller | *$49* |
| * 25 Pin Serial Cable | *$18* |
| * Split Power Y-cable | *$8* |
| * IBM Type Printer Cable | *$15* |
| * IBM AT Bus Extended Card (good for test & debug) | *$30* |
| * AT HD/Floppy Controller | *$170* |
| * Compaq 286 Hard Disk Controller | *$188* |
| * PC/XT HD/Floppy Controller | *$140* |

***CHIPS***

| | |
|---|---|
| * EPROM 2764 | *$6* |
| * EPROM 27128 | *$8* |

| *TAPE* | *INTERNAL* | *EXTERNAL* |
|---|---|---|
| * Teac | *$580* | *$680* |
| * Wangtek | *$747* | *$827* |

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|---|---|
| * Kits for Mini I/O, 2nd Serial Port | *$25* |
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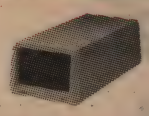
| * Math Co-processor | *CALL* |
| * Two Drive Chassis | $85 |
| * Memory Short card | *$40* |
| * AT Power supply 192 watt | *$95* |
| * 6/8 MHZ AT-compatible computer | *CALL* |
| * AT HD/Floppy Controller (XT size) | *$160* |
| * XT HD/Floppy Controller (XT size) | *CALL* |

## CHASSIS

**$99**



- W/Power supply
- Good for 2 drives

## AT HARD DISK/FLOPPY

- AT-compatible
- Western Digital Chipset

**$170**

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| 600 12" Color | 389 | 439 |
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All monitors include cables

**NEC**

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**2 Year Warranty**

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| 1509 Dot Matrix, N.LQ | 378 | 399 |

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| 192 160 CPS, 10" | 318 | 359 |
| 193 160 CPS, 17" | 449 | 509 |
| 292 200 CPS 10" | | |
| 293 200 CPS 17" | | |
| Okimate 20 | 178 | 199 |

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| P341 | 699 | 759 |
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| P351 Color | 1,079 | 1,149 |

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**D.S./D.D. 360K IBM Compatible**

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**APPLE COMPUTER**

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| Apple IIe, II+, IIc | $ 89 | $101 |
| MACintosh 800K | 248 | 309 |

**HARD DRIVES FOR PC**

**Plus Development**

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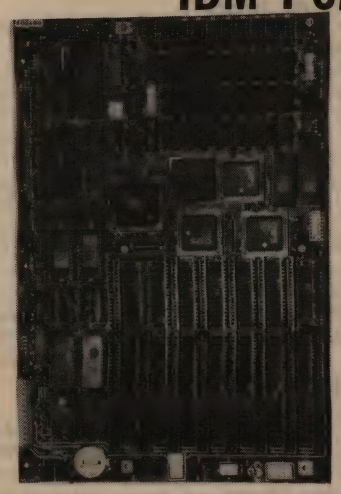

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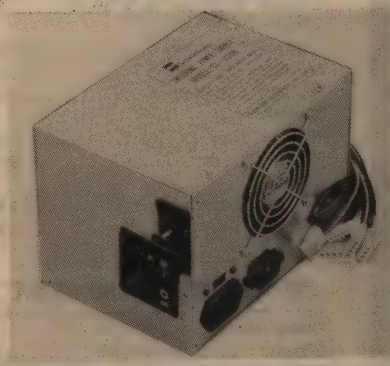

* Same Dimension as XT power supply
* 4 Drive Plugs

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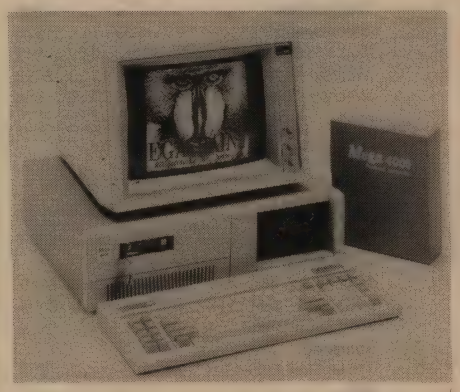
*Personal Computer*



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* System box and Operation Manual
* Six Month Warranty

**BARE BONE SPECIAL PRICE:**
**$399.00 ONLY!**

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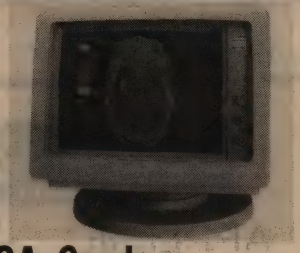
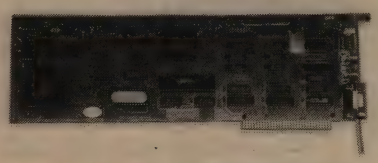
640K, 2 Slim Drives, Monochrome Graphics Card, Serial, Parallel, Game, Clock/Calender, High Resolution TTL Monitor
* Add $450.00 for 20MB Seagate Hard Drive with WD Controller; free installation

## EGA SPECIAL





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**AT STYLE KEYBOARD ..... $49**

* IBM PC/XT Compatible
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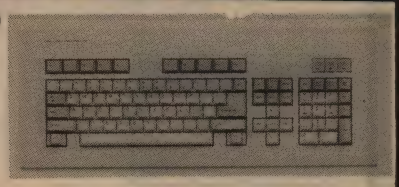
* FCC Approved

## XT AT KEYBOARD

**K-155 KEYBOARD ...$65.00**



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- ML182P or IBM version ..... $229
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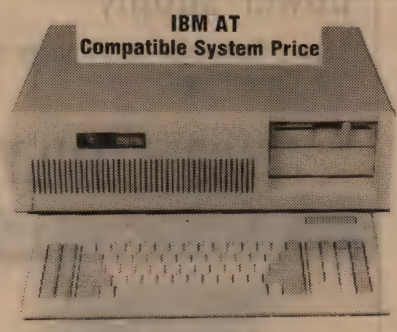


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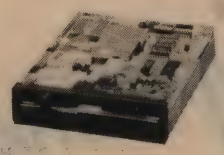

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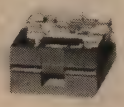

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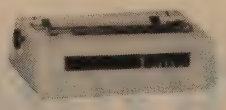

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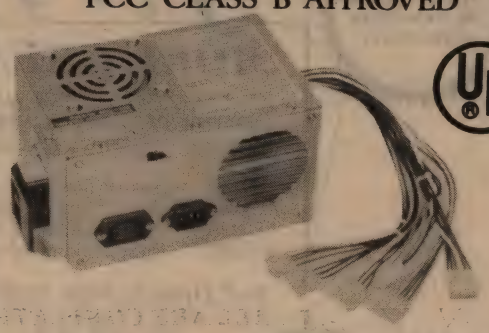

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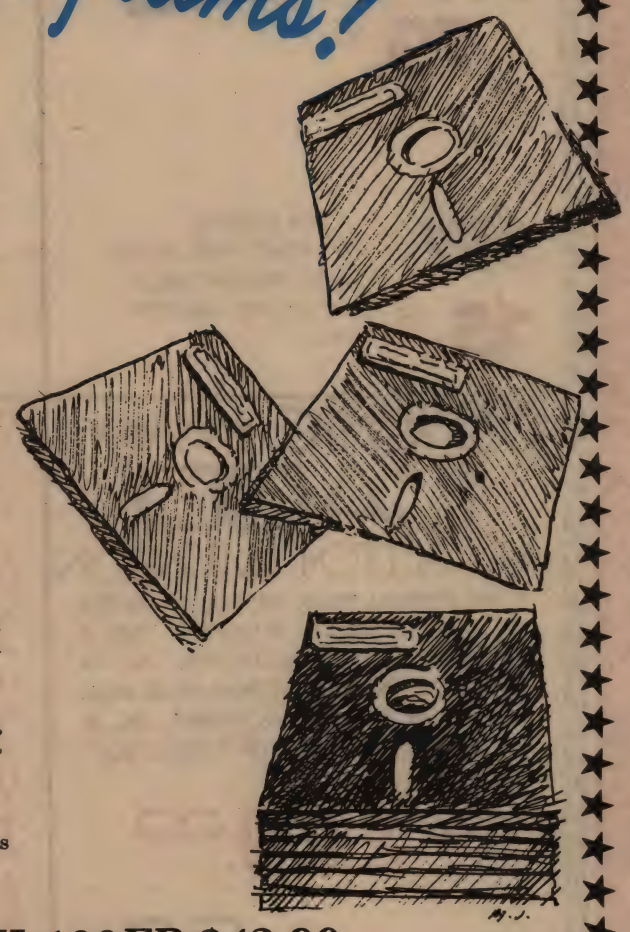

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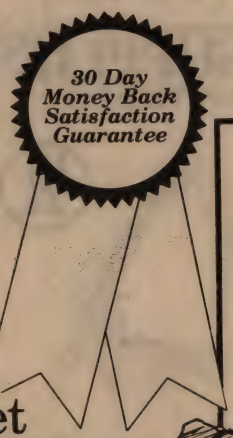


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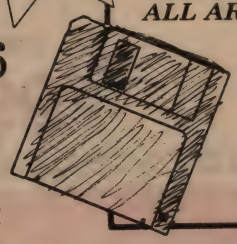

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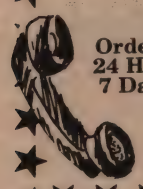

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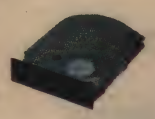

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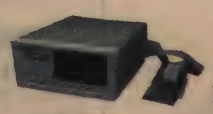

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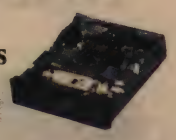

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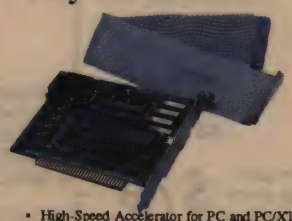

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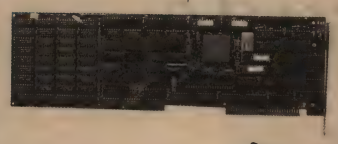

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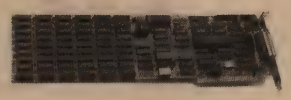

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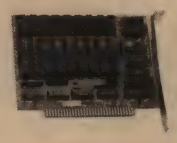

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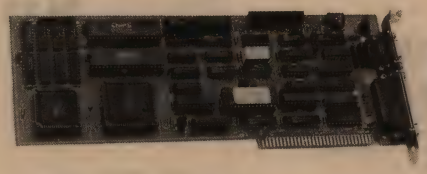

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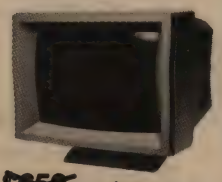

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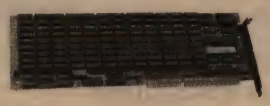

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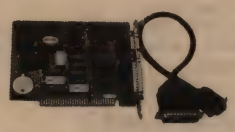

- Parallel port
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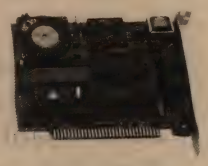

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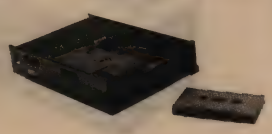

**20MB**

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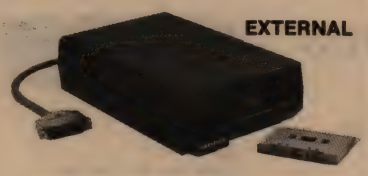

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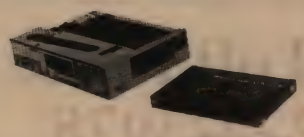

**60MB**

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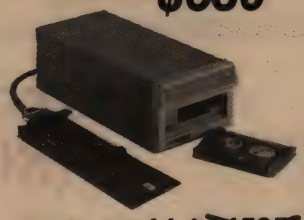

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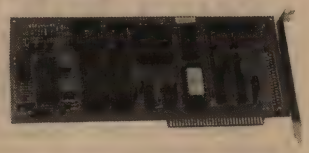

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- Western Digital controller
- 39 ms average access time
- Manuals, cables, mounting hardware and software

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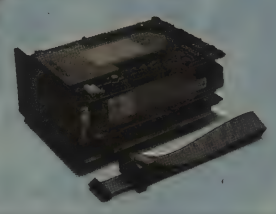

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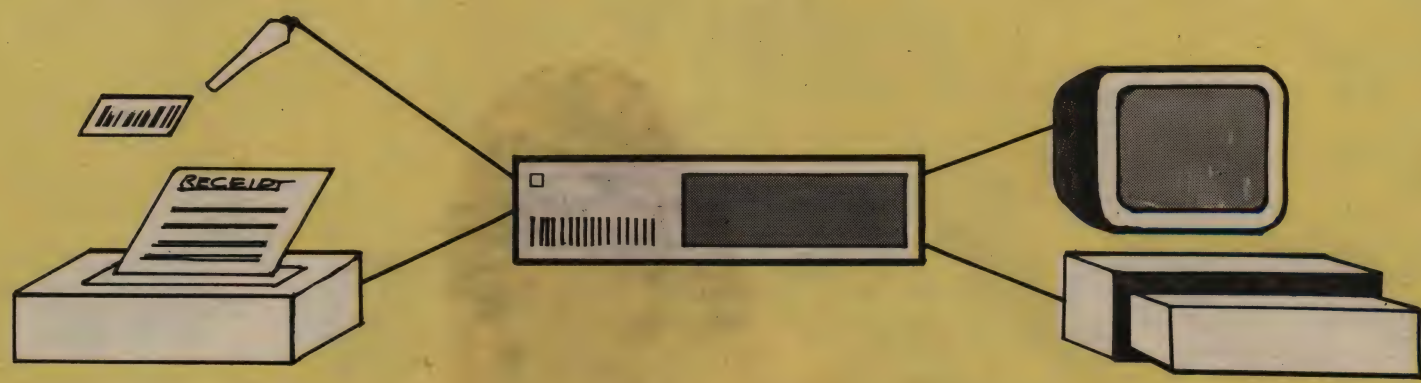
*–Knowing how much you have, how much you sold and what it cost you ...*

## COMPUTERIZED CASH REGISTER FOR RETAIL AND WHOLESALE

(by Freeman Software)




- Easy to use
- Instant sales tickets
- Professional inventory control
- Cash and account sales
- Current inventory cost
- Supervisor print outs
- End of day cash out
- Fits any Business
- Runs on IBM or other DOS computers
- Immediate inventory update
- Instant price lookup
- Current average inventory cost
- Supports up to 30 sales people
- Sales taxes included
- Gross profit at day's end

"I researched! It's better than the systems costing six hundred to a thousand dollars!

"... customer chooses what he wants. Each item is clearly labeled (using bar codes). It shows the price, the size, and so on. My cashier, Mrs. Johnson, uses the bar code wand to record the sale and run off a receipt. The receipt details the quantity, description, cost, tax and a grand total. If it's a cash sale, the cash drawer opens; if it's a charge, the cash drawer stays shut.

"While it's doing that, the computer adjusts my inventory levels and at the end of the day I can get a complete printout of all the sales, a list of all the items sold, what I need to re-order and how much money I have tied up on the shelves.

"As far as the customer is concerned, we present a more professional image and also give faster service.

"As far as Mrs. Johnson is concerned, she loves it–it's easy to use and the machine knows the price of everything in stock–no more calling across the store for prices.

"As far as I'm concerned–I've cut down on the paperwork and because of the increased control I don't run into hidden surprises."

*–Mr. M.T.*
*Waco, Texas*

**$89.95**
Software Package

### OPTIONAL ITEMS

| | |
|---|---|
| Bar Code Reader with wand (industrial grade) | **$485.00** |
| Bar Code Printing Software | **$ 75.00** |
| Cash Drawer | **$385.00** |
| Interface and Cable | **$ 43.00** |

# NDRC

**..the business computer people**

**214-750-9889**

8511 Manderville
Dallas, Texas 75231

NEW FOR '87
AVAILABLE NOW!

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**MAIL ORDER TO:** NDRC
8511 Manderville
Dallas, TX 75231

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

**PAYMENT METHOD Please do not send cash.**

☐ I've enclosed a check or money order (checks must have your name preprinted on them).

☐ VISA ☐ MasterCard ☐ American Express

Signature _____

Account Number: VISA requires 13 or 16 digits: MasterCard requires 16 digits: American Express requires 15 digits. **Expiration Date** _____

☐☐☐☐-☐☐☐☐-☐☐☐☐-☐☐☐☐

| QUANTITY | ITEM | PRICE EACH | TOTAL |
|---|---|---|---|
| | CASH REGISTER INVENTORY CONTROL SOFTWARE | $ 89.00 | |
| | BAR CODE READER WITH WAND | $485.00 | |
| | BAR CODE PRINTING SOFTWARE | $ 75.00 | |
| | CASH DRAWER | $385.00 | |
| | INTERFACE & CABLE | $ 43.00 | |

All prices quoted FOB Dallas.
Add 3% for VISA & M/C.
Add 5% for AMEX.
Prices subject to change.
Packing $3.50/order.

| | |
|---|---|
| Merchandise subtotal: | |
| Shipping & Handling | |
| Total Enclosed: | |

# TAKE A BYTE OUT OF US...

### PLAIN JANE

640k motherboard, 256k installed, Case, Power supply 135W, Hardware, manual ..... **$265.00**

### BASIC 2 DISK DRIVE COMPLETE

Two ½ Ht Disk Drives, 256K installed on 640K motherboard, IBM style case, 135W Power Supply, 5150 Keyboard, Monochrome Monitor with graphics and RGB port included. ..... **$609.00**

### PC/XT-30 COMPLETE

30 Mb, hard disk storage, 256K installed on 640K motherboard, disk drive, monitor with full graphics, AT style keyboard, BIOS, parallel port ..... **$1019.00**

### TURBO AT-20 COMPLETE

80286 Processor, 6/8 MHz, 20 Mb Hard Drive (Seagate ST225), 1.2 Mb or 360K Floppy Drive, clock/calendar, 640K RAM, Printer Port, Selectric style keyboard, high resolution Monitor (green or amber). ..... **$1895.00**

### PROFESSIONAL USER SPECIALS

| | |
|---|---|
| NEC MultiSync Monitor (800 × 560) | $ 645.00 |
| Sioma 400L | $ 425.00 |
| Taxan Color 400 | $ 375.00 |
| 80287 | $ 185.00 |
| Tecmar Q60H | $1250.00 |
| Toshiba 3100 (AT-Lap Top) | $4949.00 |

All machines come Hardware Complete. Each machine is Bench Tested for 12 hours to ensure that the computer you take home runs as it should – trouble free.

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Phones Answered 24 hrs.

### BEST OF THE YEAR SPECIAL

IRWIN 125
20 Mb Tape Backup Unit, internal for AT's

| 1 | 5-10 | 10+ |
|---|---|---|
| $350.00 | $299.00 | CALL |

All prices are quoted FOB Dallas. Add 3% for Visa and M/C. Add 5% for AMEX. Prices subject to change. Packing $3.50/order.

### SOFTWARE

| | |
|---|---|
| IBM DOS 3.1 | $ 89.00 |
| MS/DOS 3.2 + GW Basic | $ 85.00 |
| Word Perfect 4.1 | Call |
| MicroSoft Word | Call |
| Lotus 1 2 3 | Call |
| D BASE III | $389.00 |
| SNAP | $ 89.00 |
| GASP | $ 49.00 |
| It Figures | $ 39.00 |
| Printshop | $ 49.00 |
| Turbo Pascal | $ 59.00 |
| Norton Utilities | $ 69.00 |
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(Memory upgrades)

We ship you an upgraded board. You return the old one to us. Easy...

| | |
|---|---|
| 128K to 512K | $169.00 |
| 128K to 2Mb | $535.00 |
| 512K to 2Mb | $496.00 |
| Mac + to 2Mb | $489.00 |
| Keyboard/Mouse/Power Supply | in stock |
| Mac Roms | in stock |
| Mac+ Roms and Cases | SOLD OUT |

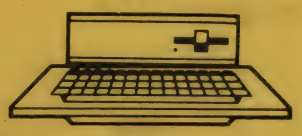
### LASER 128
(Apple IIc Clone)

Looks like an Apple, runs like an Apple, is compatible with all Apple software, and, at half the price of an Apple, is available for you today ..... **$385.00**

### Tandy 1000

| | |
|---|---|
| 20 Mb Hard Disk Kit | $425.00 |
| 0 – 512K Ram Card | $ 65.00 |
| MultiFunction 0-512 | $169.00 |
| Serial Port | $ 49.00 |

### Apple III



| | |
|---|---|
| 128 to 256K upgrade Kit | $185.00 |
| 256K Motherboards | $349.00 |
| 128K Motherboards | $165.00 |
| Powersupplies | $ 85.00 |
| Z80 SoftCard + C/PM | $ 39.00 |

### Books

| | |
|---|---|
| MS/PC DOS | $14.95 |
| Lotus 1-2-3 | $16.95 |
| DBase III | $18.95 |
| PSS (complete series) | $18.95 |
| Wordstar | $18.95 |
| Customizing Wordstar | $18.95 |
| Symphony | $18.95 |
| Managing Your Megabytes | $29.95 |
| RM/Gobol | $18.95 |
| Autocad | $18.95 |

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| | |
|---|---|
| 0–640+Bios | $ 83.00 |
| ACS 1000 | $295.00 |
| 8 MHz Turbo | $125.00 |
| 10 MHz Super Turbo | $150.00 |

### Video Cards

| | |
|---|---|
| MonoChrome | $ 39.50 |
| MonoGraphics | $ 72.00 |
| ColorGraphics | $ 62.00 |
| Graphix+MonGraph+col | $139.00 |
| The Edge (EVEREX) | $189.00 |
| IBM EGA | $225.00 |
| Taxan 555 | $165.00 |
| Sigma 400L | $399.00 |
| EGA Generic+256K | $235.00 |

### I/O Cards

| | |
|---|---|
| I/O+II | $ 64.00 |
| Disk I/O | $ 76.00 |
| Printer only | $ 24.00 |

### RAM Cards

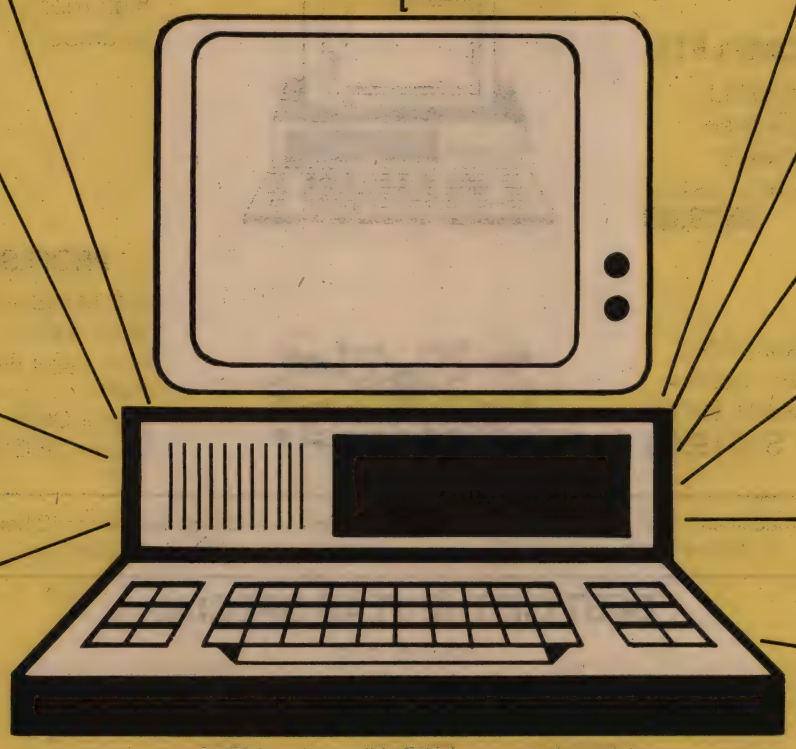
| | |
|---|---|
| 0–576K | $ 49.00 |
| 0–384K MultiFunc | $ 89.00 |
| 0–2 Mb | $169.00 |

### Cases

| | |
|---|---|
| XT Slide | $ 36.00 |
| XT Flip top | $ 39.00 |
| AT Style for XT | $ 69.00 |
| Portable Compaq style | $425.00 |

### Monitors

| | |
|---|---|
| Fortronics (Comp. Green) | $ 63.00 |
| MTR TTL (IBM Lookalike) | $125.00 |
| Color Monitor (Mitsubishi) | $299.00 |
| Taxan 14" EGA (640 x 350) | Call |



| | |
|---|---|
| 8087 | $129.00/Each |
| 256K | $ 32.00/Bank |
| 64K | $ 12.00/Bank |
| 128K | $ 4.00/Each |
| v20, 8MHz | $ 14.00/Each |

### Floppy Drives

| | |
|---|---|
| Fujitsu DSDD 5¼" | $ 79.00 |
| Teac 55B | $ 97.00 |

### Power Supplies

| | |
|---|---|
| 135 W | $ 59.00 |
| 150 W | $ 58.00 |
| UPS 200W ½ Hr. | $299.00 |

### Tape Backup

| | |
|---|---|
| 10 Mb Irwin | $ 389.00 |
| 45 Mb Tandberg | $ 459.00 |
| 60 Mb Tecmar Q60H | $1249.00 |

### Hard Disks

| | |
|---|---|
| Hard Disk Controller | $ 86.00 |
| RLL Adaptek 2070 | $145.00 |
| Cable set | $ 6.00 |
| 10 Mb | $169.00 |
| ST225 (20Mb) | $285.00 |
| 30 Mb Kit | $485.00 |

### Keyboards

| | |
|---|---|
| 5150 | $ 47.50 |
| AT Style | $ 69.00 |
| 5151 | $ 72.00 |

### Apple II+/e

| | |
|---|---|
| IIe MotherBoards Rev A | $299.00 |
| II+ MotherBoards | $175.00 |
| 80 Col Card | $ 39.00 |
| IIe Premium SoftCard | $125.00 |
| IIe RGB Cards | $ 99.00 |
| Keyboards | $ 75.00 |
| Parallel Port | $ 45.00 |
| Power Supplies | $ 69.00 |
| Hal/MMU/IOU/CD/EF | in stock |
| Laser 128 | $385.00 |

### AT PARTS

| | |
|---|---|
| 1.2 Mb Floppy Drive | $125.00 |
| 360K Floppy Drive | $ 79.00 |
| 80287 | $199.00 |
| NEC 80286 replacement | $ 65.00 |
| Multi 3Mb | $199.00 |
| Case | $ 79.50 |
| 200W PowerSupply | $109.00 |
| KeyBoard | $ 57.50 |
| AT Motherboard+Bios | |
| 6 or 8 MHz No Wait States | $549.00 |
| 0–1.5 Mb MultiFunc | $199.00 |
| Hard/Floppy Disk Cont | $169.00 |
| I/O Parallel/2 Serial | $ 85.00 |
| AST Advantage+128K | $199.00 |
| V5O 80286+33% | $ 75.00 |

### RECONDITIONED COMPUTERS

| | | |
|---|---|---|
| ITT 10Mb+1DD | (Dos) | $1,149.00 |
| Eagle PC 2DD | (Dos) | $ 599.00 |
| Sperry PC 2DD 8MHz | (Dos) | $1,049.00 |
| Epson HX-12 Laptop | (CPM) | $ 499.00 |
| Epson QX-10 2DD | (CPM) | $ 599.00 |
| IBM 2DD | (Dos) | Call |
| Compaq Portable | | Call |
| AT&T 6300 | | Call |
| Televideo TS 1603 | (Dos) | $ 600.00 |
| Apple IIe (CPU) | | $ 499.00 |
| Apple II+ (CPU) | | $ 265.00 |
| Apple IIc | | $ 575.00 |
| Laser 128 (IIc clone) | | $ 385.00 |
| Apple III (128K) | | $ 499.00 |
| Macintosh | | Call |
| Wang Printer (Diablo 620) | | $ 299.00 |
| HP 7470A Plotter | | $ 599.00 |

### IBM Disk Drive Alignment System

The DDAS allows you to easily set the alignment of Floppy Disk Drives (5¼") double, single or quad quickly, accurately and without a scope. Prior technical experience not needed.

| 1 | 2-5 | Dealer (6+) |
|---|---|---|
| $124.00 | $119.00 | Call |

"AT" Kit ..... Add $25.00

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- ☐ 1. IBM & Compatible Parts
- ☐ 2. Apple II+/e Parts
- ☐ 3. Macintosh Parts & Upgrades
- ☐ 4. Shrinkwrap machine ☐ 5. Networking PC's
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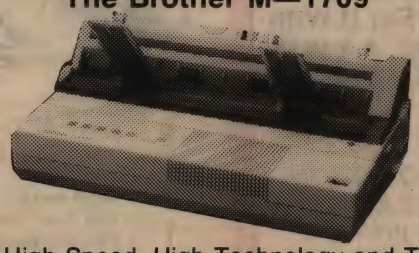
# when it's time to buy a printer

# LEAVE THE TURKEYS ON THE TABLE!

## Call S-100 and Sit Down To A brother

### The Brother M—1709



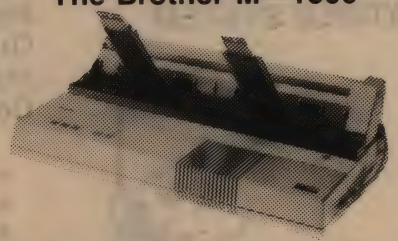
High Speed, High Technology and Top Performance at your Fingertips!

The M—1709's Features Include:

- ____ 240 CPS Draft Mode
- ____ CPS NLQ Mode
- ____ Epson & IBM ProPrinter Compatible
- ____ 24K Buffer Memory
- ____ Wide Carriage
- ____ Auto Paper Loading
- ____ Paper Parking
- ____ Dual Interfaces
- ____ Quiet Operation
- ____ Push Tractor

**List Price ~~$699~~ CALL**

### The Brother M—1509



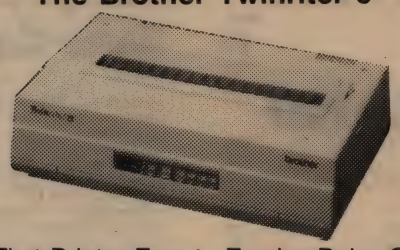
What Epson and Okidata call "Options" Come "Standard" on the 1509!

Test Drive These Specs:

- ____ 180 CPS Draft Mode
- ____ 45 CPS NLQ Mode
- ____ Epson & IBM Compatible
- ____ Wide (15") Carriage
- ____ Auto Paper Loading
- ____ Push Tractor
- ____ Dual Interfaces
- ____ Quiet Operation

**List Price ~~$599~~ CALL**

### The Brother Twinriter 5



The First Printer Ever to Employ Daisy Quality With Dot Matrix Speed and Graphics!

Now you can have daisy wheel **and** dot matrix. Charts, graphs and tables can be included within a letter quality document without complex changes!

- ____ 36 CPS Daisywheel
- ____ 140 CPS Dot Matrix
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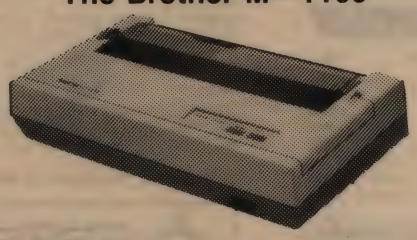
- ____ 136 Column Carriage
- ____ 3 KB Print Buffer
- ____ Front Panel Controls
- ____ Parallel Interface
- ____ Sub/Super Script

**List Price ~~$1295~~ CALL**

### The Brother M—1109



Unbeatable Brother Quality in a Compact Package With a Compact Price to Match!

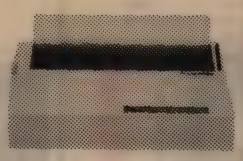
See What $189 Buys at S-100:

- ____ 100 CPS Draft Mode
- ____ 25 CPS NLQ Mode
- ____ Epson & IBM Compatible
- ____ 80 Column Carriage
- ____ 2 KB Print Buffer
- ____ Tractor Included
- ____ Parallel Interfaces
- ____ Quiet Operation

**List Price ~~$299~~ $189**

### The HR-15XL

The Affordable Daisy



17 CPS Daisywheel - True Letter Quality - 3 KB Buffer - Red & Black Printing - Sub/Superscript - Proportional Spacing

**List $599 NOW $299**

limited quantities

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### The 2024L

24 Pins - No Waiting

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*"THE PC PEOPLE"*

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SINCE 1977

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### ET-286

**When Intel Finally Releases A 12MHz Processor You'll Be Ready For It With Our 8, 10 and 12MHz ET-286. A 1 Wait State 80286 CPU 100% IBM-AT Compatible.**

*The ET-286 ALSO INCLUDES:*

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- *6 AT AND 2XT COMPATIBLE SLOTS*
- *2 CENTRONICS PARALLEL PORTS*
- *3 RS232 / 2RS422 SERIAL PORTS*
- *CLK CAL W/ BATT BACKUP*
- *CASE, 200W P/S, KEYBOARD*
- *FCC APPROVED*

**THE ET-286 BASIC SYSTEM $1395**

10MHz No Wait State Special Order Or 12MHz 1 Wait State - Allow 5 Weeks.

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RAMPAGE! ..... $256
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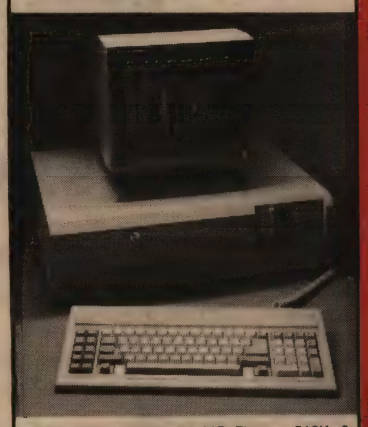
SAFE (SAFT) *SPS1000* WATT SINE WAVE . 989

### SPERRY

**The Sperry PC/IT Systems**



PC/IT 8MHz 80286, 1.2 MB Floppy, 512K, 8 Slots ..... CALL
PC/IT Enhanced with 1MB RAM, 1.2MB Floppy, 40MB Hard ..... CALL
Model 400 HT PC Compatible, Floppy & 20MB Hard And Mono Monitor ..... CALL
MICRO IT Enhanced ..... 1549
*Keyboards:*
AT Style ..... $99
Professional ..... $179

**CALL 1-800-528-3138 NOW!**

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DYSAN *300XL* (3M COMPAT) ... CASE/10 $195
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DYSAN *104/2D* DSDD 5¼" ..... CASE $209
DYSAN *204/2D* 96 TPI DSDD 5¼" .. CASE $345
DYSAN *UHR2* Ultra Hi-Density ..... CASE $445
DYSAN *3740/2D* 8" ..... CASE $282
MAXELL *MD2* 5¼" DSDD ..... CASE $123
MAXELL *MD2-HD* (IBM-AT) ..... CASE $235
MAXELL *MF2-DDM* 3.5" DSDD ..... CASE $235
MAXELL *FD2* 8" DSDD ..... CASE $239
XIDEX *PRECISION* DSDD 5¼" ..... CASE $79

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***We Sell All Well Known Brands***
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***Opened Software Is Not Returnable***

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D Base III Plus ..... $399
D Base II *Version 2.43* ..... 289
Framework II ..... 399
Friday ..... 169

### BORLAND

Sidekick ..... $31
Superkey ..... 39
Turbo Pascal *Version 3.0* ..... 39
Turbo Pascal *with 8087* ..... 62
Turbo Lightning ..... 56
Turbo Graphics Tool Box ..... 31
Turbo DataBase Tool Box ..... 31

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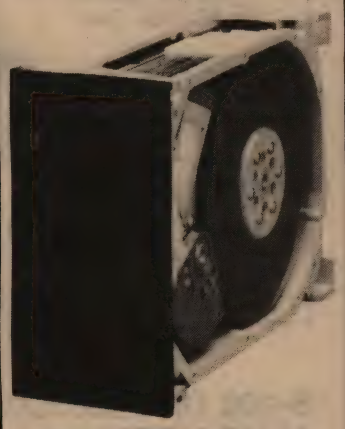

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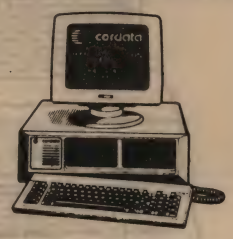

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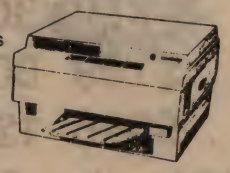

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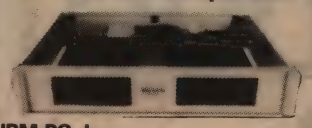

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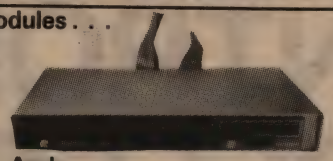

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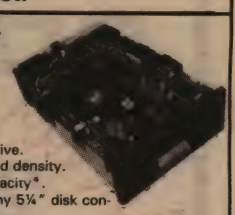

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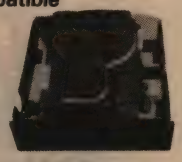
Tandon TM55-4 DS/Quad
Item #1904 **$89.50**

## 3½", 10 MB HARD DISK DRIVE IBM Compatible

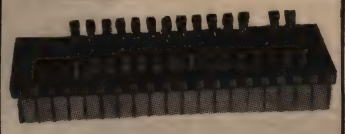


ST225 Compatible. Fits standard 5¼" spacing. Shock mounted. High speed, low power.
Mfr — MMI #MM212
Item #9217 **$179.00** New

## 9" HI-RESOLUTION (TTL) VIDEO MONITOR

Orange phosphor. Originally used in portable computers. 12 VDC.
Mfr — Phillips M24-308-LA/P
Item #6811 **$19.95** New

## NS 87P50D-11 MICROCOMPUTER

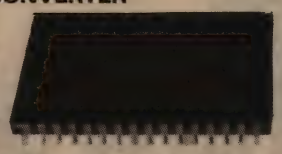


8-bit single chip microcomputer units, emulates: 8048/49/50. Piggy-back config. allows you to plug in an eprom 2758 and 2716, 2732. Features: XMOS, 5V, 8-16 bit, 4K directaccess memory, 256 bits on chip ROM, 11 MHz max. frequency.
Item #8899 **$24.95** New

## MICROCOMPUTER with EPROM

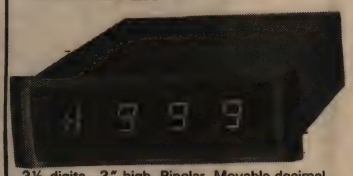
The MC68701 is an 8-bit single chip microcomputer unit which enhances the capabilities of the M6800 family. TTL compatible, requires one +5V power supply for nonprog. operation. Includes 2048 bytes of eprom, 128 bytes of RAM, serial comm. interface (SCI), parallel I/O, and a 3-function programmable timer.
Item #9496 **$9.95** (house numbered)

## ANALOG TO DIGITAL CONVERTER



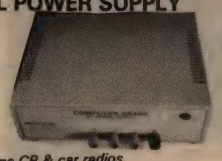
Binary output: 12 bit; Conversion time: 8 microseconds; Linearity: 8 ms. ²1/2 lbs. Parallel and series outputs; internal reference.
Mfr — Datel ADC-HZ-12BGC
Item #7052 ***Special* — $39.95** (RFE — tested good!)

## DIGITAL VOLTMETER



3½ digits, .3" high. Bipolar. Movable decimal point. Accuracy: .05%. Nominal range 2 VDC. Case size: 2½"W x ⅞"H x 3⅜"L
Mfr — Non-Linear Systems #PM349
Item #9219 **$19.95** New

## COMPUTER GRADE EXTERNAL POWER SUPPLY

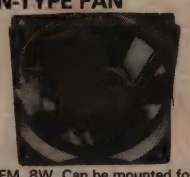


*Other uses–runs CB & car radios. Comes ready to plug in!*
DC Output: −5V @ .5 amp.
+5V @ 3 amp.
+12V @ 6 amp.
Input 115V/60H. Dim: 9¼"W x 3¾"H. (Rubber ft. incl.)
Item #9501 **$24.95** NEW

## 12 VDC SPRINT® FAN

17 CFM, 12 VDC, 1.4 Watts. Polarity protected. Can be mounted for cooling or exhaust.
Dim.: 3¼" sq. x 1¼" deep
Mfr — Rotron DAYNA
Item #9218 **$12.95** New

## 12/24 VDC 1" THIN, MUFFIN-TYPE FAN



55/100 CFM, 8W. Can be mounted for blowing or exhaust. 5 plastic blades with feathered edges, aluminum housing. Brushless, ball-bearing type.
Dim.: 4¹¹⁄₁₆" sq. x 1" deep
Mfr — Centaur CUDC24K4-601
Item #8541 **$19.00**

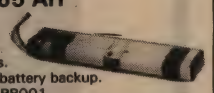
## 115 CFM — 5 BLADE

115 VAC/60 Hz., 21 W., 28 amps., 3100 RPM; 5-blade model, aluminum housing. Can be mounted for blowing or exhaust.
Dim.: 4¹¹⁄₁₆" sq. x 1½" deep
Mfr — Howard Ind. 3-15-3455 or IMC Boxer WS2107FL
Item #5345 **$5.95** RFE

## 12V @ 450 ma.

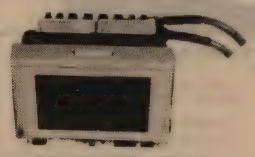
Contains 10 AA cells. Recharge rate: 45 ma. 16–18 hours. Case with tab output connections.
Dim.: 2¹⁄₁₆"H x 1¼"W x 2¹⁵⁄₁₆"L
Mfr — GE 123233 or equivalent
Item #5443 **$5.95** RFE

## 13.2V @ 1.65 AH



Contains 11 C cells. Portable computer battery backup.
Mfr — GE 41B03JBB001
Item #5444 **$15.95** RFE

## CASSETTE DIGITAL DATA DRIVE



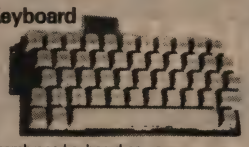
Serial format. Search 80IPS — Read/Write 20IPS. 12V motor, 5V logic, 8 & 9 pin connector cables. Originally designed for the Adam.
Dim.: 5"W x 3¾"H x 4" deep
Item #6641 **$9.95** New

## ADAM CASSETTES (Assorted)

Consists of Smart Basic, Buck Rogers, and blank cassettes (all can be easily erased). Item #7786 — Bakers Dozen
13 for **$19.95** New

## Mechanical Keyboards...

### 48-Key Keyboard

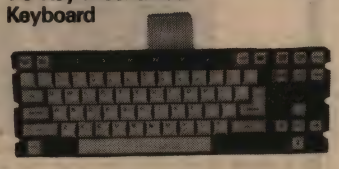


Replace the membrane keyboard on your Timex/Sinclair Z-81/1000 with this brand new "big computer" keyboard from Texas Instruments. Simple to install — complete instructions and schematic included.
Item #6712 **$5.95** New

### 66-Key Mechanical Keyboard

Grey keys with black letters. Connecting cable included.
Dim.: 15¼"L x 5"H.
Item #9394 **$5.95** New

### 75-Key Mechanical Keyboard



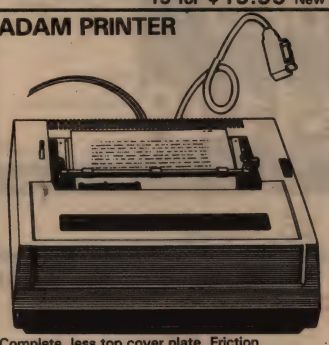
21 user-defined keys, SPST mechanical switches, 21-pin ribbon cable connection. General instructions for replacement of membrane keyboards included. Update computers such as the Timex Sinclair Z81/1000.
Dim.: 13½"W x 1¾"H x 5" deep
Item #7429 **$5.95** New

## ADAM COMPUTER KIT

*(Less printer & w/o cabinet)*

Build it yourself from subassemblies. No wiring necessary (just plugs together). Hook-up diagram included. Includes: Keyboard, 2 cassette digital data drives, 2 game controllers, power supply, all memory boards, and one cassette. Is capable of running CP/M, has built-in word processor.
Item #7410 **$99.00** (complete)

## ADAM PRINTER



Complete, less top cover plate. Friction feed. Takes standard paper 8½ x 11". (Customer returns; tested—operational.)
Item #8839 **$69.50**

### ADAM ACCESSORIES

| | | |
|---|---|---|
| Data Drive | #6641 | $9.95 |
| D.D. Power Supply | #6642 | $14.95 |
| ASCII Keyboard | #6643 | $19.95 |
| Asst. Cassettes | #7786 | $19.95 |

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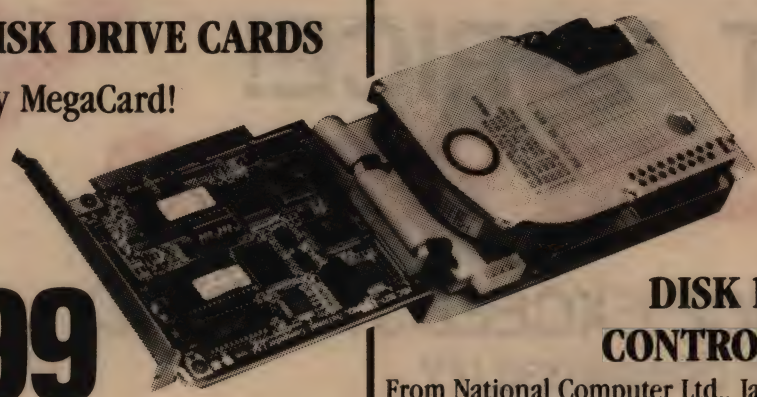

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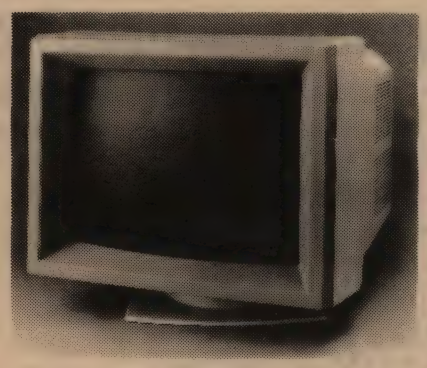

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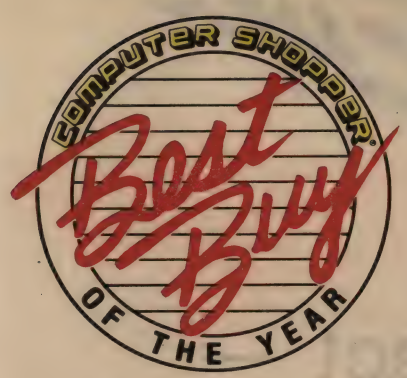


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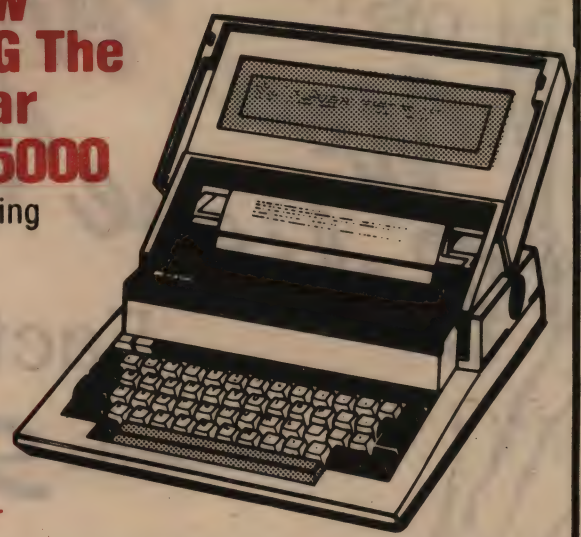

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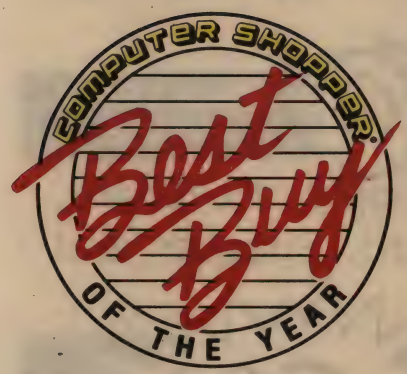


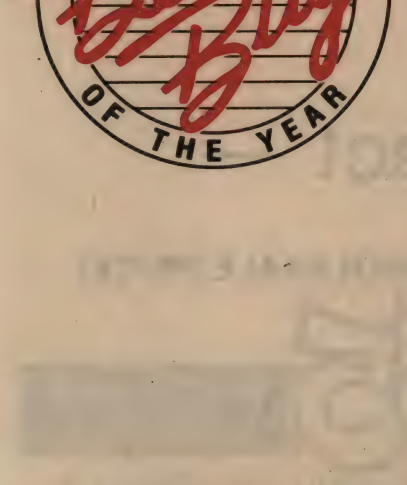


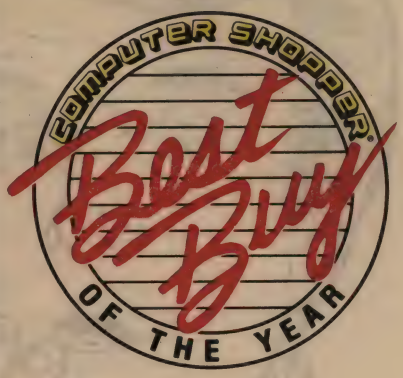


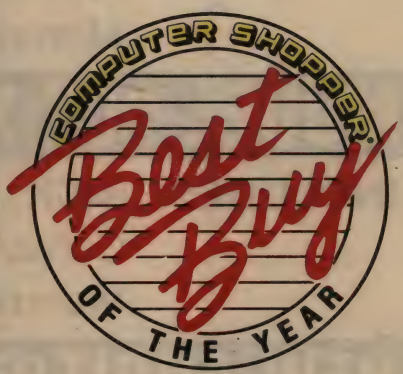


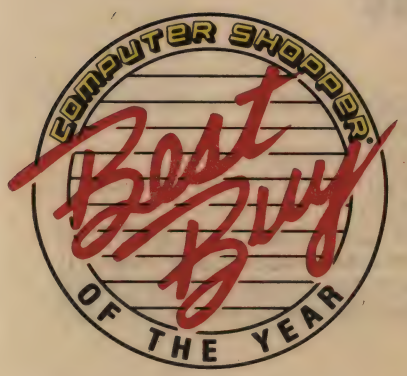


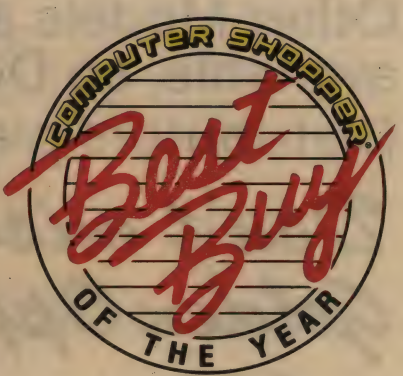

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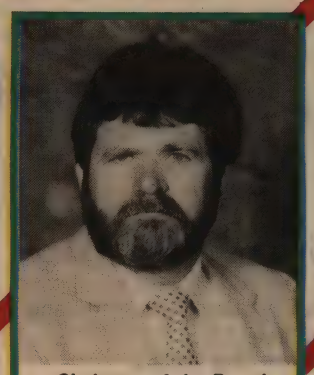

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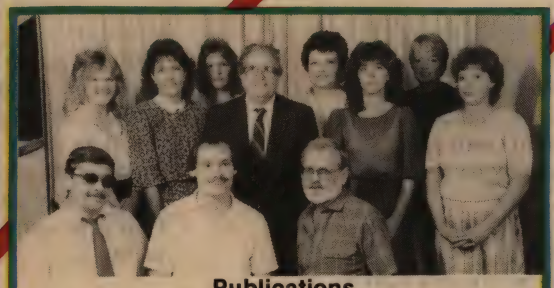

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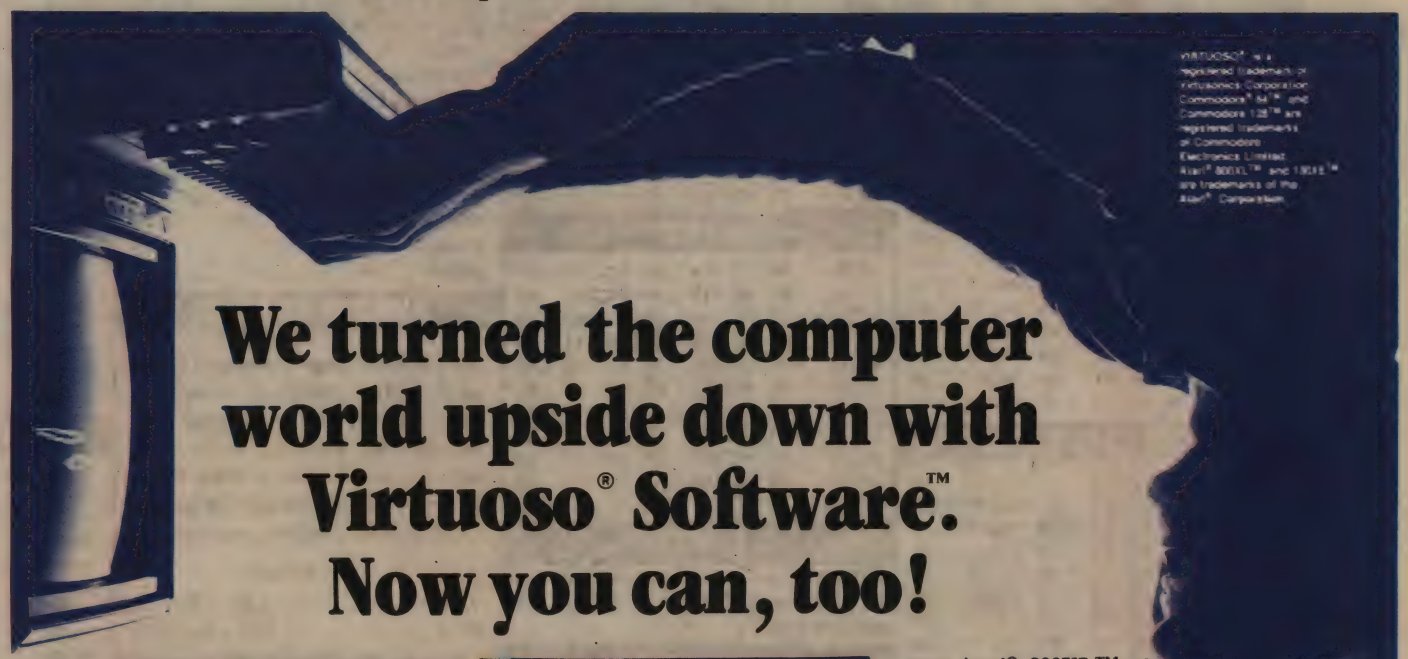

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|---|---|---|---|
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| LM317T | .65 | LM1489 | .45 |
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| LM339 | .40 | ULN2003 | .59 |
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| NE555 | .22 | 3341 | .75 |
| NE556 | .45 | MC3403 | 2/.99 |
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| NE564 | 1.29 | MC4024P | 2.29 |
| NE567 | .49 | UA4136 | .59 |
| NE570 | 2.00 | 4558 | .40 |
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| LM723 | .35 | MM5395 | 1.25 |
| LM733 | .49 | DS8835 | 1.50 |
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| LM317T | .65 |
| 723 | .35 |
| 78M05T - 500 MA | .22 |
| 7805T | .35 |
| 7808T | .50 |
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| 7912K | .50 |
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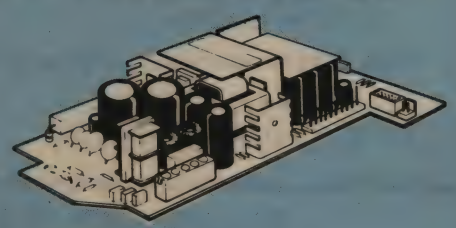

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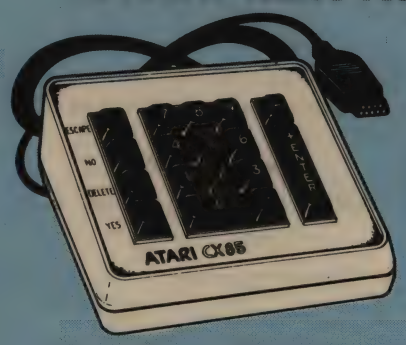


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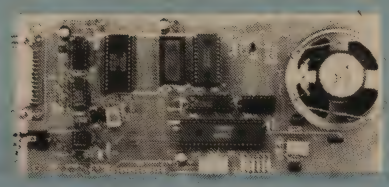

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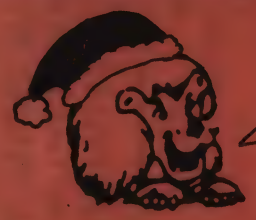

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We accept checks, VISA, Mastercard. Purchase orders from qualified firms and institutions. U.S. funds ONLY. California residents MUST add 6.5% tax. C.O.D. add $1.90. Shipping is UPS. Add $2.00 for ground — $5.00 for air up to 5 lbs. Call for over 5 lbs. All major manufacturers. All parts are 100% guaranteed. Pricing subject to change without notice. $10.00 minimum order.

## 576K RAM HALF CARD

only $56

Without memory
LIST PRICE $119

- Full IBM PC, XT compatibility
- Brings System up to 640K
- Uses 64K and/or 256K DRAM
- Low power consumption
- Optional Clock/Calendar Module with 20-year battery

384K $108 576K $131
512K $119 CLOCK ADD $59

## MONO GRAPHICS HALF CARD

only $98

LIST PRICE $379

- Full IBM PC, XT, AT compatibility
- TTL monochrome output
- 720 x 348 pixel graphics
- Hercules monographics compatible
- Parallel printer port
- 64K video RAM built-in
- IBM and Lotus 1.2.3 compatible

## COLOR GRAPHICS HALF CARD

only $95

With Parallel
LIST PRICE $229

- Full IBM PC, XT, AT compatibility
- 640x200 mono; 320x200 color pixels
- Hercules Color Card compatible
- Parallel printer port
- Light pen interface
- Low power consumption
- FCC Certification

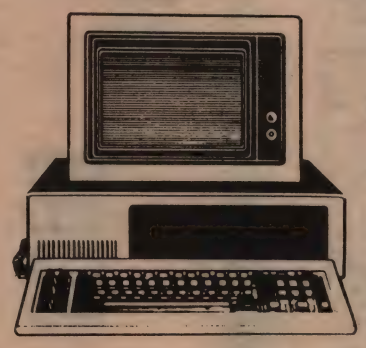
# Conroy•LaPointe Inc.

Since 1978

*"The name says it all."*

## Conroy-LaPointe XT/Model 1 $475

### IBM PC/XT Compatible



- 256K Expandable to 640K On Motherboard
- 360K Floppy Drive
- 8 Expansion Slots (6 long, 2 short)
- Enhanced AT Style Keyboard
- MS-DOS 2.11
- Macro Assembler
- FCC Class B and UL Approved
- Limited Warranty: 1 Year Parts, 90 Days Labor

With 640K, Mono Graphics Card, Monitor **$649**
Above System with 20Mb Hard Disk **$1075**

### Installed Options (for Model 1 and 2)

| | |
|---|---|
| Graphics Card & Monitor | $175 |
| 640K RAM (from 256K) | $55 |
| 360K Floppy Drive | $95 |
| 20Mb Hard Disk | $435 |
| 30Mb Hard Disk | $475 |
| Serial/Parallel/Clock/ Game Port Upgrade | $55 |

## XT/Model 2 Turbo $595

### Dual Speed 4.77 & 8.0 MHz Processor

- 256K Expandable to 640K On Motherboard
- 360K Floppy Drive
- 8 Expansion Slots (6 long, 2 short)
- Enhanced AT Style Keyboard
- MS-DOS 2.11
- Macro Assembler
- FCC Class B and UL Approved
- Limited Warranty: 1 Year Parts, 90 Days Labor

With 640K, Mono Graphics Card, Monitor **$769**
Above System with 20Mb Hard Disk **$1195**

### BOARDS

| | |
|---|---|
| **MAGNUM** EconoRAM | $ 89 |
| PC MasterCard, "0"K | $105 |
| PC MasterCard, 384K | $159 |
| PC MasterCard, 1.5Mb | $269 |
| **AST** SixPak 384K | $199 |
| SixPak Premium 512K | $375 |
| RAMpage XT 256K | $259 |
| RAMpage AT 512K | $475 |
| Advantage AT 128K | $389 |
| **CONROY** Mono Graphics | $ 79 |
| EGA Card | $235 |
| **HERCULES** Color Card | $159 |
| Graphics Card Plus | $209 |
| **VIDEO 7** VEGA (short card) | $385 |
| **ORCHID** Turbo EGA | $649 |
| **CENTRAL POINT** Option Board | $129 |
| **MICROSOFT** Mouse | $125 |

### DISK DRIVES

| | |
|---|---|
| **CDC** 360K Floppy PC/XT | $ 95 |
| **TOSHIBA** 1.2 Mb Floppy AT | $159 |
| **CMS** 21Mb Disk Card | $425 |
| **SEAGATE** 20Mb Hard Disk XT | $425 |
| 30Mb Hard Disk XT | $475 |
| 30Mb Hard Disk AT | $625 |
| 40Mb Hard Disk AT | $849 |

### SOFTWARE

| | |
|---|---|
| **ASHTON-TATE** dBase III+ | $459 |
| **DAC** Easy Accounting | $ 47 |
| **MICROSOFT** Word | $295 |
| **LOTUS** 1-2-3 v2 | $359 |
| **MULTIMATE** Multimate 3.3 | $215 |
| **WORDPERFECT** WordPerfect 4.1 | $235 |
| **CENTRAL POINT** Copy II PC | $ 23 |
| PC Tools | $ 24 |

### MONITORS

| | |
|---|---|
| **AMDEK** 310A Amber TTL | $159 |
| **NEC** Multisync | $675 |
| **SAMSUNG** 12" Amber TTL | $ 95 |
| 12" Amber Composite | $ 69 |

### MODEMS

| | |
|---|---|
| **CONROY** 1200 External | $139 |
| 1200B Internal | $135 |
| 2400 External | $295 |
| **HAYES** Smartmodem 1200 | $419 |
| 1200B Internal | $385 |

### DISKETTES

**CONROY-LAPOINTE**

| | |
|---|---|
| DS/DD 5¼ 10/100 | $ 9/69 |
| DS/HD 5¼ 10/100 | $18/159 |
| DS/DD 3½ 10/100 | $20/17 |

## Conroy-LaPointe AT/Model 16 $1250

### IBM PC/AT Compatible

- Dual Speed 6.0 and 8.0 MHz Processor
- 512K RAM Expandable to 4.0 Mb on Motherboard
- 1.2 Mb Floppy Drive
- Space for up to 2 Additional Floppy Drives/Tape Backups
- Space for up to 2 Hard Disk Drives
- Enhanced AT Style Keyboard
- Multi Layer Motherboard—Enhances Reliability, Reduces Radio Interference
- FCC Class B and UL Approved
- MS DOS 3.2, Macro Assembler, MBASIC 3.2
- Limited Warranty: 1 Year Parts, 90 Days Labor

### Installed Options

| | |
|---|---|
| Upgrade to 1Mb RAM | $55 |
| Graphics Card & Monitor | $175 |
| 30Mb Hard Disk | $645 |

## Laser 128

Apple IIe & IIc Compatible

## $395

- 128K RAM, 32K ROM
- Internal Floppy Drive
- 1 Expansion Slot
- Parallel Port
- Serial Modem Port
- Serial Printer Port
- Mouse/Joystick Port
- Copy II+ & 10 Diskettes

With Monitor **$469**
With Monitor, Printer and 2nd Disk Drive **$895**

# 1•800•547•1289

## In Oregon 1•800•451•5151

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## Ordering Information:

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Shipping Charges: U.S. & Puerto Rico 3% ($5 Minimum) • Canada 12% ($15 Min.) • APO, FPO—U.S. Rate PLUS $5 • Foreign 18% ($25 min.) • Prices reflect a 3% discount for cash, so add 3% for on VISA, MasterCard, or American Express purchases.

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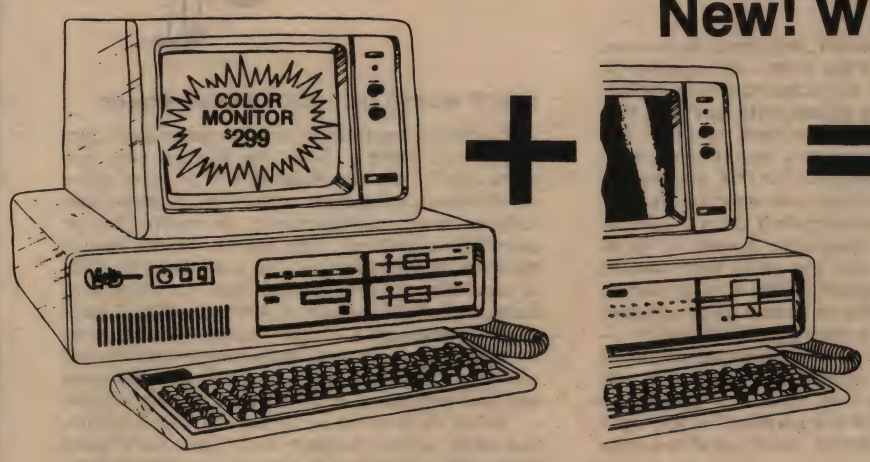
# THE VIOLIN-ATC!!

## IBM-AT COMPATIBLE *ONLY BETTER*

**New! With 180 Day Warranty**




# + = $995

| | |
|---|---|
| 8 Slots | 2 Drive Openings |
| + 4 Slots | + 2 Drive Openings |
| = 12 Slots | = 4 Drive Openings |

## COMPARE GODFATHER'S HARDWARE

| | VIOLIN-ATC | COLUMBIA ATC-6000 | IBM AT | YOUR CLONE |
|---|---|---|---|---|
| # of Expansion Slots | 12 | 12 | 8 | ? |
| # of ½ Height Drive or Tape Slots | 5 | 5 | 4 | ? |
| # of Drive Slots in Front of Case | 4 | 4 | 2 | ? |
| Clock Speed MHz | 6 or 8 | 6 or 8 | ? | ? |
| Memory Included as Standard | 512K | 512K | ? | ? |
| Max Memory on Motherboard | 1024K | 1024K | ? | ? |
| Power Supply Watts | 230 | 230 | 192 | ? |
| Manual Reset Switch | YES | YES | NO | ? |
| Runs UNIX | YES | YES | YES | ? |
| EGA Card Compatible | YES | YES | YES | ? |
| 80287 Math Coprocessor Slot | YES | YES | YES | ? |
| Clock Calendar | YES | YES | YES | ? |
| Godfather's Factory Service | YES! | YES! | NO! | NO! |

*Huge Bundle is available separately (without MS-DOS) for $300 for other clones!!*

## INSTALLED OPTIONS IN COMPUTER*

| | |
|---|---|
| 20 Meg Hard Drive | $349* |
| 2 Hard 2 Floppy Controller w/cables | $189* |
| 1.2 Meg or 360K Floppy | $135* |
| Internal Memory to 1 Megabyte | $149* |
| Internal Modem | $149* |
| Serial/Parallel Board | $ 65* |
| Color or Mono Board | $ 99* |
| Enhanced Graphics/CGA Board | $349* |
| 80287 Math Coprocessor Chip | $249* |
| Keyboard (AT-Style) | $ 75* |
| MS-DOS 3.2 & GW-Basic | $ 95* |
| Huge Software Bundle with THEMENU | $ 95* |

**Free Installation and Burn In! Call for Other Options.*

Few machines can match the hardware features of the VIOLIN-ATC, but they may try to do so in the future. To stay ahead of the rest we are including lots of software to this long list as it becomes available to us. Your hard drive will come already loaded and tested with most of this software, configured with an easy to use menu system so you will not have to learn MS-DOS as soon as you start. We have tested a large number of software packages and have found that the VIOLIN-ATC runs all the same software as the IBM-AT that we tested.

**THESE PROGRAMS ARE INCLUDED IN HUGE SOFTWARE BUNDLE:** MS-DOS 3.2 • MS-DOS tutorial • BASIC & BASICA • TIM-IV relational data base • Perfect Filer DBMS • Perfect Writer • Perfect Writer tutorial • Perfect Speller (50,000 words) • Perfect Calc spreadsheet • Perfect Calc tutorial • Fast Graphs • Perfect Link (modem program) • Home Accountant Plus • Hardware Diagnostics • THEMENU system •

Besides these, the VIOLIN-ATC runs all the popular IBM programs such as LOTUS, DBASE, AUTOCAD, WORDSTAR 2000, WORD PERFECT, and many more.

We insure your VIOLIN-ATC will work reliably because of our extensive burn-in and testing. If service is required you can be assured that we will promptly repair or replace your VIOLIN-ATC during your 180 day warranty. Parts and service will be available on a continuing prompt basis to serve you after that. Call before you order to confirm availablility and exact configuration as prices and specifications are subject to possible change. We also will custom confirgure your VIOLIN-ATC with reliable upgrades such as memory, monitors, EGA cards, larger or more hard drives and tape backups to maintain the quality you expect from Godfather's. I hope you are convinced that we have the best IBM-AT compatible, and for the best price anywhere.

WE ONLY BUY USED EQUIPMENT . . . UNLESS NEW COSTS LESS

*Columbia Data Products, Inc. Announces a New Program . . . The Rectifier!*

NEW! INSTANT RESTORE PROGRAM! RESTORES YOUR HARD DRIVE TO LAST UPDATE AFTER ACCIDENTAL FORMAT, POWER OUTAGE WHILE WRITING, SABOTAGE, VIRUSES, OR OTHER NASTY UPSETS. ALSO INCLUDES SPEEDUP, WHICH OPTIMIZES YOUR HARD DRIVE PERFORMANCE. SIMPLE ONE PAGE MANUAL INCLUDED. ONLY $49, SITE LICENSES AVAILABLE.

TERMS: CASH, CERTIFIED CHECK, MONEY ORDER, OR BANK WIRE. ADD 2% FOR TELEPHONE MASTERCARD AND VISA AS PRICES ARE DISCOUNTED 2% FOR CASH. ADD $35 PER VIOLIN-ATC AND $10 PER MONITOR. SHIPPING AND HANDLING UPS GROUND. FLORIDA RESIDENTS ADD 5% SALES TAX.

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# THE COMPATIBLE SHOPPER

## *(A Survival Guide to Computer Shopping)*

As I was searching for a topic for this month's letter, my wife was absent-mindedly leafing through the pages of this magazine.

"LOOK, AN XT-COMPATIBLE FOR ONLY $250!!! AND A REAL IBM-XT FOR $1500!!" she exclaimed. Being a bargain-hunter at heart (her motto is "born to shop"), she was so excited that I hesitated to burst her bubble. "Read the fine print," I muttered, not bothering to explain the myriad of reasons behind such "too-good-to-be-true" prices. Then I realized I'd just stumbled across a topic for this column.

Our conversation went something like this:

**WHAT'S THE DIFFERENCE, THEY ALL SAY "COMPATIBLE"?**

Full software and hardware compatibility means that all software and hardware components are interchangeable and work the same in the original or in the compatible machine. True 100% compatible computers are counterfeits, so the trick is to find a computer that's functionally equivalent without being an illegal copy. How much compatibility you need depends on what you are using now. No problem. . . just ask the manufacturer if your software runs on his machine (if he can talk to the manufacturer — and he has tested it). But how DO you insure future compatibility when you need hardware or software enhancements? You choose a stable company that gets consistently high ratings for compatibility and one that can provide future support. For example, although industry experts have always ranked Columbia a top compatible, we recently discovered that it was not EGA compatible. So we changed the ROMBIOS in version 4.36 for their existing products from time to time. Many other large manufacturers who claimed full compatibility for their products, and then had them fail in the marketplace, are dropping some models because they are not as compatible as their newer ones.

**CAN A COMPANY ADVERTISE A COMPUTER THAT IS AN ILLEGAL COPY?**

Sure, it's done all the time by many vendors. Many computer products that come in from overseas have the ROMS removed before shipment so they can pass customs. IBM and others are now attacking the source of the supply instead of just the vendors. According to a recent article in *Infoworld*, "IBM is regularly testing PC clones for infringement of IBM's copyright on the BIOS software for its machine." If you purchase one of these questionable clones, you may own an orphan when legal problems cause the manufacturer to disappear. Columbia's ROMBIOS was designed independent from IBM and has never been challenged.

**IF IT HAS A WARRANTY, IT MUST BE RELIABLE, RIGHT?**

The warranty is important, but reliability involves several factors. First, it has to be a well engineered product that has been subjected to extensive EMI, heat, and high voltage stress tests to insure that the unit will last. It must also meet rigid FCC and UL requirements. (I was nearly electrocuted while testing an imported computer for FCC approval — we found the power supply was wired backwards. We rejected that manufacturer!) Each individual component must be thoroughly burned in for at least 72 hours to prevent 25¢ parts from causing $250 repairs. Some manufacturers only do sample testing, so some defective computers do get shipped. The most important reliability consideration — consistent performance — can only be judged by the computer's track record. What do the experts say? How many have been sold? Are the owners satisfied? Is there a service contract? If you can't get satisfactory answers to these questions, then beware.

**WELL, WHAT ABOUT THE WARRANTY?**

Warranties show the good intentions of the manufacturer. Few manufacturers plan to abandon their warranty, but lack of adequate planning and resources sometimes hinders performance. How many claims could be handled by a business offering a two-year parts, labor, and satisfaction warranty . . . from a company that started last week "building" computers in their garage? FCC and copyright violations can also hurt your chances of using your warranty since legal problems weaken the company. On the other hand, if a company enjoys a good service reputation along with a reliable product, you can be confident they will honor the warranty.

**WHAT SHOULD I LOOK FOR IN EXPANDIBILITY?**

We may soon have 500 megabyte databases in the form of laser disks . . . but only if your computer can support the necessary hardware and operating systems. The number of expansion slots, size of the power supply, speed, number of drive openings, and memory capacity are also important factors if you want to add something that wasn't envisioned when the machine was originally designed. For example, when 8087 math coprocessors were selling for $400, some manufacturers did not include this socket. Although networking capabilities are still not widely needed, this is just one example of functions that may be excluded if your computer is not appropriately designed. Many manufacturers still do not include space for at least four drive-size devices or the power to run them. As you can see, it is very important for a manufacturer to plan for the implementation of new technology after the purchase.

**ISN'T IT IMPORTANT TO BUY A NAME BRAND?**

It is really important to compare equivalent configurations. Make a list of the features that you want. Ideally, you should be able to price the same combinations of equipment from two or three carefully selected manufacturers. In reality, this is possible but difficult, because you cannot always tell what they have left out. For example, if MS-DOS is included, do you assume that it comes with Basic and all the manuals? What you DON'T want to do is assemble a conglomeration of parts from 10 different advertisers, chosen strictly by lowest prices. Avoiding such dubious bargains will save you time and money in the long run. A case in point . . . today we received a distress call from a Columbia owner whose bargain hard drive (purchased from another dealer) quit working just after its two-week (and "too weak") warranty expired. He ended up throwing the drive away and purchasing a proven drive from us (with a minimum 90-day warranty!).

**IT LOOKS LIKE THE COLUMBIA IS A GREAT VALUE FOR THE PRICE. WHAT ELSE CAN YOU TELL ME ABOUT IT?**

The fact that there are 70,000 Columbia owners says a lot about its popularity and reputation. They are also well supported by the Columbia Owners Group. COG is currently sending newsletters to 15,000 registered owners and plans to reach the others by word of mouth. Fully documented versions of DOS and BASIC, as well as a readable operations manual, are included in the purchase price. We have designed our latest Columbias so you can start using the computer immediately without having to learn DOS. We have done this by not only loading the hard drive with all the software, but by setting it up with a menu system that bypasses DOS commands. When you get ready to learn DOS, we not only have DOS tutorials but a unique on-line help feature as well. Just type "HELP" from DOS and your questions will be answered! (See the next few pages for many other Columbia features). And don't forget the seller's reputation. The Godfather has been around a few years and plans to protect his name. You can depend on Godfather's to stand behind its products.

After completing my short course in compatible shopping, Mrs. Godfather is sold on Columbia. She thinks you'll agree . . . IT'S AN OFFER THE DISCRIMINATING "COMPATIBLE SHOPPER" CAN'T REFUSE!!

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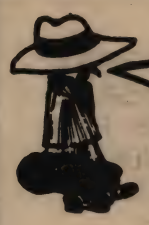
*Columbia Data Products, Inc. Announces a New Program. . . The Rectifier!*



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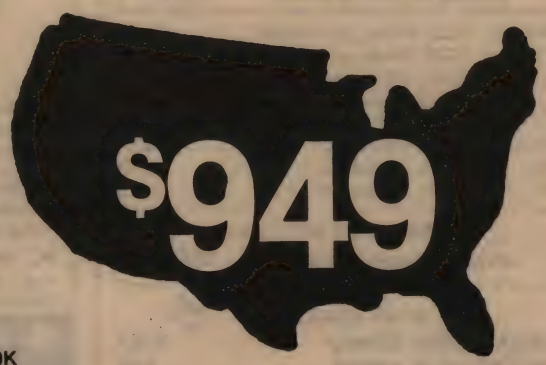


### INSTALLED OPTIONS

| | |
|---|---|
| 20 MEG Upgrade | $249 |
| 640K Upgrade | $149 |
| 1200B Internal Modem | $199 |
| Color Monitor w/stand | $299 |

*Free Installation and Burn In!*

*CALL FOR OTHER OPTIONS.*

**2 Floppy System. . . Only $799**

### HARDWARE

• 128K RAM expandable to 1 Megabyte • 360K double-sided, double-density floppy drive • HD power supply that supports a 20-MEG w/tape back-up • Keytronics-style keyboard with lights • Two serial RS-232's & parallel port • Eight full-length IBM® -compatible expansion slots • 16-color CGA adaptor • **FCC, UL & CSA APPROVED!** Latest 4.36 EGA-compatible BIOS.

### SOFTWARE

Lots of other machines can match the hardware features (without matching the price), but the main reason you want the Columbia is for its complete compatibility and a record of proven reliability. Virtually every software program and peripheral that function on an IBM PC work on the Columbia. The heart of each Columbia is the 8088® microprocessor, just as it's the heart of an IBM PC. And every Columbia is factory-configured to run MS™-DOS 2.11 and GW™-BASIC 2.0 (BASICA), much the same as the IBM PC operates PC-DOS and BASICA. The result is not just a degree of compatibility but the true standard . . . Columbia!! Your Columbia comes with a huge bundle of software . . . 16 FREE programs WORTH OVER $3000! It also comes with 5.7 MEG of software ALREADY INSTALLED on your hard drive PLUS THEMENU! This means you don't have to learn MS-DOS before you can run your Columbia!

**These programs include:** • MS-DOS 2.11 • MS-DOS tutorial • BasicA 2.0 (this runs all the IBM GW BASIC programs we tried) • Perfect Writer • Perfect Writer tutorial • Perfect Speller (50,000 words) • Perfect Calc spreadsheet • Perfect Calc tutorial • Perfect Filer DBMS • Fast Graphs (color) • Perfect Link (modem program) • Home Accountant Plus • Columbia MPC tutorial • TIM IV relational data base • Space Commanders • Hardware diagnostics •

Columbia also runs all the popular IBM programs such as Lotus 1-2-3, Symphony, dBASE III, Visacalc, Wordstar, Flight Simulator II, Microsoft Word, and many, many more!

### WARRANTY

**We offer a 90-day parts and labor warranty with our product.** We also service the Columbia out of warranty (should you ever need it); in addition, ITT SERVCOM and Honeywell services out-of-warranty machines nationwide.

We hope you are convinced that the Columbia is the best IBM-compatible available . . . and that **GODFATHER'S** is offering it for the best price (for any comparable product) anywhere!

### COG MEMBERSHIP

When you purchase your Columbia, you will undoubtedly want to immediately join the **Columbia Owners Group** (COG). Some of the advantages of membership are: • Quarterly newsletter to keep you informed of latest information on computer "tips and tricks," available upgrades and/or additional uses for existing hardware/software, a Contributor's Corner" for suggestions from other group members, etc. • Special pricing on items from Columbia Data Products, Inc. directly through the Columbia Owners Group •

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**Fully IBM PC/XT/AT COMPATIBLE *all in one***
**More Powerful than the IBM AT**
**ONE YEAR WARRANTY**

- 8 mhz expandable to 1 meg
- SEAGATE 30meg HARD DISK
- CHINON 360K & 1.2meg FLOPPY DISKS
- NEC Multisync w/EPIC EGA CARD
- MS DOS 3.2 + GW BASIC 3.2

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**Quality Name Brands + FCC/UL Approved**

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**suggested list 4750.00**

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## NEW PRODUCT

**INCREASE YOUR DRIVE CAPACITY 50%**
**INCREASE YOUR DRIVE SPEED 50%**
**with the NEW**
**KONAN KXP-230 "DRIVE MAXIMIZER"**
**HARD DISK CONTROLLER**

This compact 5" hard disk controller card uses the new surface mount technology. With special software built in to an eprom on the card, the Konan HD Controller increases your existing hard disk by 50%. No additional controller needed.

**20meg + KXP-230 = 30meg**
**30meg + KXP-230 = 45meg**
**40meg + KXP-230 = 60meg**

BEST BUY **INTRODUCTORY PRICE $169.00**

## DISK DRIVES

**FLOPPY DISKS 5.25" Half Height**

| | |
|---|---|
| CHINON 502L 360K | 85.00 |
| CHINON 506 1.2meg | 115.00 |
| TANDON TM65-2 360K | 94.00 |
| TANDON TM50-2 360K | 68.00 |

**HARD DRIVES**

**★SEAGATE ST225 SPECIAL★**
**20meg w/card & cable $382**

| | | |
|---|---|---|
| SEAGATE | ST225 20meg half height | $300.00 |
| | ST238 30meg w/card & cable | 476.00 |
| | ST4026 20meg w/linear voice coil | 494.00 |
| | ST4038 30meg w/linear voice coil | 588.00 |
| | ST4051 40meg w/linear voice coil | 684.00 |
| TANDON | TM262 20meg half height | 300.00 |
| NEC | D5126 20meg half height | 310.00 |
| NEC | D5146 40meg half height | 503.00 |

**★NEC 5146 SPECIAL★**
**40meg w/card & cable $584**

NEW *NOW AVAILABLE* BEST BUYS

| | |
|---|---|
| SEAGATE ST251 40meg | $722 |
| w/KXP-230 & cables | 876 |
| SEAGATE ST4096 80meg | 1179 |

## CARDS & BOARDS

**HARD DISK CONTROLLER CARDS**

| | |
|---|---|
| KONAN KDC-230 | $85.00 |
| KONAN KDC-230T for TANDY 1000 Computers | 85.00 |
| KONAN KXP-230 Drive Maximizer | 169.00 |

**EGA COLOR GRAPHICS CARD**
***the EPIC Graphics Adapter by NSI***
100% IBM EGA, CGA, MDA Compatible
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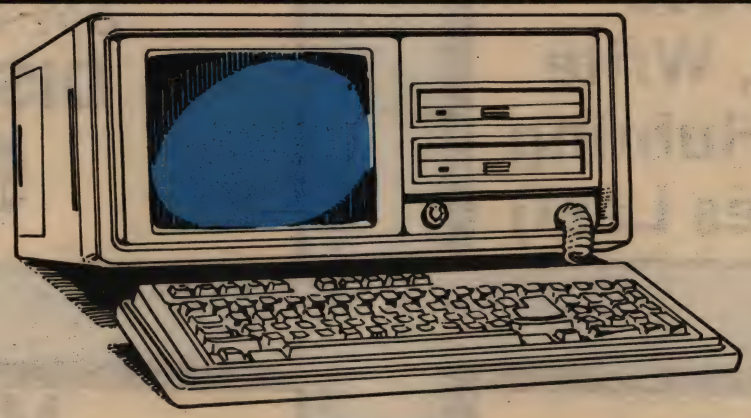

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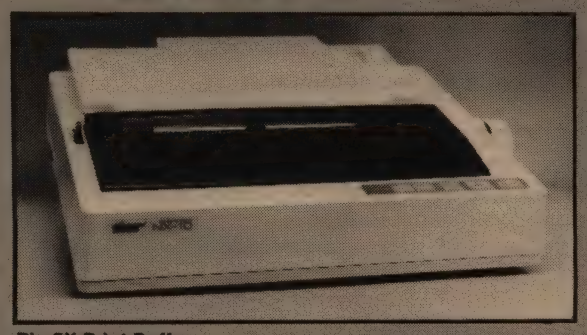

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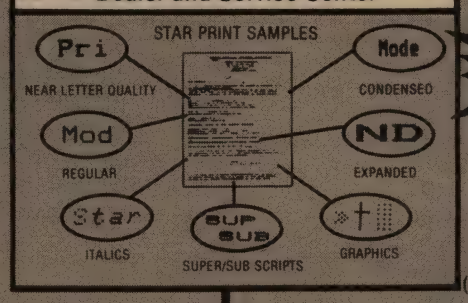


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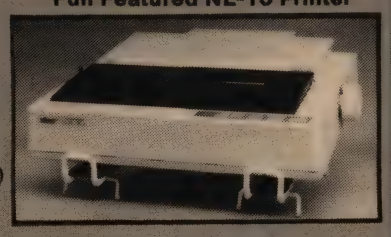

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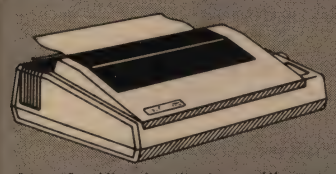

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# Wells American
## A★Star Multi-User Computer

by Lon Andrews

Oh Boy! Just what I need, another clone! At least this one is home owned and home grown. West Colombia, South Carolina is about as home grown as you can get. Like a lot of us, I am getting a little tired of looking at the same wheel being reinvented every other month so when *Computer Shopper* asked me to look at the A★Star, a fully compatible IBM AT clone, I was not as enthusiastic as I could have been. Stick around and see why I changed my mind in a hurry. This computer is a whale of a buy. There, now that I've said it, I guess I had better get down to the business of explaining why.

When I brought the A★Star home and set it up, I was immediately met with, "What? Another computer? You have got to be out of your everlovin' mind!" It took a while to convince my better half that it was temporary and would go back in a week or two. Even then she wasn't sure. I guess I do have a habit of collecting a "few small things."

Once the computer was set up, I took some time to look it over. It is definitely "Born in the USA" (sorry Bruce). Everything fits with no loose parts (except for the battery case) and no rattles. The first impression I had was HEAVY(!) when I picked it up. Inside the case it is neat and well designed. It just looks like quality! The IBM AT compatible keyboard plugs into the rear of the case. This was one of the minor things that I found that I didn't like. The keyboard cable could be a foot longer and not hurt my feelings at all. If it plugged into the front of the case it would be about right. The monitor plugs into a socket on the video board and gets its power from an auto on and off socket in the rear of the case.

Inside the case is "NEATNESS!" There are 8 expansion slots—6 sixteen bit and 2 eight bit slots. Four half-height (or two full height) drives will slide right in with no problems. This provides a heck of a lot of drive capability. Nothing in the assembly is tight or bent into place. Screws for the case fit with no maneuvering to make the holes match. The case is heavy and well formed to the computer. I am accustomed to the Tandy keyboard so the A★Star's seemed a little cumbersome to use. The number lock, caps lock and scroll lock indicator lights are on the top of the board rather than on the keys. The key action isn't as crisp as the Tandy's but it isn't objectionable.

Wells American A★Star Computer

The A★Star power supply is the most powerful offered with this type of computer. It is rated at 220 watts with four separate output cables for disk drives or tape drives. This can provide full power for future expansion boards, as well as two hard disks, a tape backup and a floppy disk drive. The supply power input has a wide tolerance and can operate from either 110VAC or 220VAC at 43 to 67Hz.

The disk drive controller is built into the motherboard. This frees up a slot that would otherwise be dedicated to the controller card. All cable connections are already available on the motherboard. Also available on the motherboard is a memory capability of 1024K (a full megabyte) without using an expansion slot. Memory is user installable. Additional memory boards of up to 16Mbyte can also be installed. The A★Star is also equipped to accept the 80287 numeric co-processor. Disk drive and expansion board installations are as simple as I have seen in any computer. I could find no areas that would cause any difficulty in adding any accessory to the computer. If this were my computer, the first thing I would do is mount the battery case (clock and calendar) to the inside rear of the case with some screws or a nylon cable tie. It came with two strips of double sided tape to hold it and was bouncing around inside the case. Not much to complain about is it?

Booting from the hard drive is a lot faster than I am used to with my Tandy 1000. The model I was supplied with had a 30MHz full sized hard drive and one floppy. The difference in operating speed is noticed very quickly. DIR produces a quick scroll and it's gone. You gotta be fast!

A peek at the specification sheets provides the following info: CPU = 80286, Keyboard = American made, with tactile feedback for the touch typist, 84 keys including 10 function and an 18 key numeric keypad. 220 watt power supply with 110/220 input, weight 37 lbs. and an all steel case. The rest of the information can be found elsewhere in this article.

The A★Star is equipped with a 80286 CPU switchable (software or manual) operating speeds of 6 and 8MHz. There is a user installable (10 minutes time and $495) option available that will allow operation at 10 and 12MHz also. The manual switch is a toggle on the rear of the case and to switch by software is as simple as running a program (Setspeed) from DOS. I have a compiled dbase III database for our church that I have been using for the last year. I copied it over to the A★Star to use as a comparison. Normally there are 5 operations that I perform on my Tandy Model 1000 as part of the normal maintenance of the database. I ran these 5 tasks at both 6 and 8MHz to see how they compare with the 1000.

| Test | 1000 | 6MHz | 8MHz |
|---|---|---|---|
| 1 | 23 sec | 11 sec | 9.5 |
| 2 | 1:30 | 38 sec | 29 sec |
| 3 | 4:45 | 2:02 | 1:30 |
| 4 | 15:57 | 5:31 | 3:59 |
| 5 | 9:26 | 3:30 | 2:47 |

It doesn't take a great brain to see the difference. Using Norton's Utilities' SI the Tandy rates at 1. The A★Star rates at 5.1 at 6MHz and 7.7 at 8MHz. The documentation claims that at 12MHz it rates at 13.2. All these are compared to the IBM PC at a rating of 1.0. Some of the programs that I ran were hard to keep up with as they scrolled by, but they all ran. Word processing was a joy at both 6 and 8MHz. The only problem I had was several games that seemed to get lost in the increased speed. Dropping from 8MHz to 6MHz cured the problem with running but with an arcade game you have to be a lot faster than I am to keep up with the action.

The A★Star is factory warranted and fully FCC certified and is for 90 days with extended service agreements available. If for some reason you don't like the A★Star you can make use of a 31 day money back guarantee. You like it, or you get your money back. Can't beat that with a stick.

Another extra is Multi user/Network capability built right in to the motherboard. The A★Star is network ready when combined with an optional network adapter. You can network up to 255 units using coaxal cable to connect the work station to a file server. The coaxal connects to a cable connection on the rear of the computer. Nice and simple. The LAN Software (available as an option) uses many of the normal DOS commands so as to allow operation and set up by persons without a lot of network experience.

The batteries I mentioned

continued on page 136

# The Epson Equity III

by Andrew M. Fried

**Introduction**

Today's microcomputer market in many ways has begun to resemble the American jean industry. Levi's were to jeans what IBM was to PCs.

As each brand reached the pinnacle of success, others began to copy them. Original competition to the large originators began in the United States but quickly moved overseas when competition centered on pricing. Today it's hard to tell the originals from the copies, since in many cases they are one and the same.

Epson America has just released their new, imported, 80286 based AT clone called the Equity III. If you are interested in a Computer functionally equivalent to the 6MHz IBM PC AT, the Equity III should be of interest to you!

**Specifications**

Before I list all of the Epson's specifications, there is one feature in particular that I would like to point out, and that is the clock rate. For whatever reasons they had, Epson set the clock speed of Equity 3 to the old IBM AT speed of only 6MHz. This makes it one of the lowest clones AT available today.

From the inception of the clone industry, most motherboards featuring the original "industry standard" clock speed of 6MHz for ATs also boasted alternative speeds of 8MHz or greater. This way, if a software package proved incompatible at higher speeds, the system could be slowed down to the AT speed.

Bowing to industry pressure created by Compaq and the offshore market. IBM finally set the clock rate of their AT motherboards to 8MHz. This move was not overlooked by the clone industry—they simply demonstrated "one upmanship" and produced clones running at 10, 12 and even 16MHz. Why Epson chose a sissy speed of 6MHz is beyond me.

Getting back to the specifications, the Equity III has the ability to load up to 640K of RAM directly on the motherboard and is expandable up to 15.5 Mbyte using expansion cards. In addition to the RAM, there is 32 Kbyte of ROM on the system board.

The Equity III accommodates eight expansion slots, six of which offer the full 16-bit bus and remaining two an 8-bit bus. Just like the AT, the Equity contains a built in real time clock/calendar.

The power supply included with the Equity is rated at a hefty 200 watts, over three times the capacity of the original PCs of several years ago. This obviously is due to the increased use of more memory and bigger hard disks.

Epson built a serial port as well as a parallel port directly into the motherboard, and for most users, this is all you'll ever need.

Also incorporated on the system board is a plug-in floppy/hard disk controller. This controller will support up to two floppy drives (supports both the standard 360K format as well as the 1.2MB format) and two hard disks (which supports various formats).

Utilizing the motherboard in such a way has one very positive result—of the eight expansion slots built into the Epson, seven remain available after the system is configured. It also has a drawback, though, and that involves system maintenance. When you have a single $49.00 I/O card that fails, replacement is usually more desirable than repair. When that same function is built into a $700 or $800 board, repair becomes necessary.

I personally am of the opinion that separate is better. Last month a lightning strike in my area destroyed my modem, but not before it got to my serial card. I disposed of the $39 card and replaced it with another $39 card. At no time was my system down, only the modem itself. Had the Epson serial port been the victim, I would have had to send it off for repair leaving me without a computer at home.

**Enclosure**

The enclosure used by Epson to package the Equity III has a few interesting characteristics. First, the box is rather spacious, having dimensions of 21.0" wide by 6.25" high with a depth of 17.0."

Epson included a keylock on their unit (I wonder if anyone actually uses those things?) and an ON-OFF switch on the right hand side just like IBM did on theirs. But they have one thing that IBM doesn't—right there on the front of the case, in unrestrained reach and clear view is an honest to goodness reset switch. For us hacker subtypes that are forever crashing our systems, the Equity provides us with a way to reboot our computer without using the power switch, when CTL-ATL-DEL dies! It works and works very well.

**Keyboard**

The Equity keyboard layout is in almost all respects identical to an AT keyboard. The only obvious difference is that it is entirely plastic and the indicator lights are built into the keys themselves. In an article a few months ago, I mentioned my biggest gripe about clone computers was that they almost always had mushy keyboards. From the amount of mail I got from my readers, I'm not the only one that hates mushy keyboards. Well, I can honestly say that the Epson Equity III has the best keyboard I've ever used, next to, of course, the real thing, (IBM).

The Epson keyboard offers 84 keys consisting of a 54 key QWERTY keyboard, an 18 key numberic keypad and 10 function keys. What sets it apart from the other clones is its tactile response. The keyboard requries an intentional amount of force to depress the keys, it is clean and crisp. The spring tension is perfect which enables fast typist unlike myself, to type without double characters. The keyboard is the Equity III's strongest feature.

**Monitor**

The first Equity III that arrived for review came with a color graphics monitor and a CGA graphics adapter. Unfortunately, the hard disk arrived DOA (Dead On Arrival) and the unit was returned to Epson for replacement. When the replacement arrived, it had a monochrome adapter. As I had kept the monitor originaly sent me, I had to remove the monochrome card and replace it with a color card in order to use it.

Fortunately, I had an AST ColorGraphPlus card that also needed reviewing, so I placed it in the Equity! Alas, I can't describe either of the adapter cards provided by Epson, but I can speak about the monitor.

The 13" RGB color monitor, which is made in Korea under the Epson label, provided excellent color clarity. One feature I didn't like about the monitor is that the video cable on the monitor side doesn't unplug from the unit.

The monitor contains a high-contrast screen with an etched surface (designed to reduce glare) and has a 18MHz video bandwidth.

*Computer Shopper* also provided me with a Princeton Graphics Monitor to review so I also tested it with the Epson Equity III. The review is presented as a sidebar.

**GWBasic**

If I were to single out one misunderstanding about clones, it would have to be in the area of BASIC. To begin with, the BASIC that accompanies IBM PC computers does not consist wholly of software. Located on the IBM computers are ROMS (read only memory) that contain a very large portion of the routines used in BASIC and BASICA. These routines are used in much the same manner as is the ROM BIOS routines also found in ROM on the PC motherboards. The BASIC software provided with PC-DOS relies on these ROMS for certain information and without these ROMS PC Basic will not function. Since it's illegal to copy these ROMS, Microsoft created a software only version of BASIC and called it GW-BASIC. While the syntax is almost identical to the PC-DOS counterpart BASICA, GW-BASIC does not rely on any ROM support whatsoever; all components of the language

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**continued on page 140**

# Princeton Graphic Systems HX-12E

by Andrew Fried

One color monitor has established itself as a defacto standard in the arena of medium resolution monitors, the Princeton Graphic Systems monitor HX-12E.

Featuring a maximum resolution of 770x350 (770 dots per line with 350 lines per screen), a 64 color capability (when used with the EGA card) and a pixel size of only 0.28", the HX-12E is capable of supporting both the color graphics adapter (CGA) as well as the enhanced graphics adapter (EGA).

The 12-inch monitor (measured diagonally) has an active display area of 215mm x 160mm featuring a 90 degree deflection dot type black matrix tube. This is a tube that is comfortable to look at. You can use the HX-12E with either the CGA or EGA Graphics Cards. Incorporated in the monitor is special circuitry capable of differentiating between the 22KHz signals from an EGA card and the 15.7KHz signals generated by the CGA adapter. In doing so, the monitor automatically adjusts itself to the computer's configuration without the need for manual adjustment.

When operating in the color graphics mode (CGA), the HX-12E is capable of producing 16 different colors; the available colors are red, green, blue, yellow, cyan, magenta, black, and white. These colors are created by a combination of red, green and blue signals along with two intensities of each combination.

When operating in the enhanced graphics mode (EGA), the possible color combination increases to 64 various colors. This increase in the number of colors is accomplished by utilizing a different pin configuration.

Under the enhanced graphics mode, each color has two leads; one lead produces the color in two-thirds intensity while the other lead produces the color in one-third brightness. In this manner, each color can be off, on one-third, on two-thirds, or on full intensity (both color leads on).

Video controls that are accessible externally on the HX-12E located outside the case include brightness, power, contrast, horizontal hold, vertical hold and vertical size. Within the case itself, there are controls which can regulate the B+ adjust, vertical size, horizontal width, vertical height, screen bias, horizontal center, vertical center, focus and RGB gain.

One feature that the Princeton Graphic Systems monitors are famous for is quality of the colors. Unlike other monitors (the Tecmar, for instance), the reds come out red and the blues come out blue. The HX-12E is no exception; the condition of their colors is excellent.

While I don't know what the suggested retail cost of the HX-12E is, a quick thumb through *Computer Shopper* indicates that the mail order price for the monitor runs between $535 and $550.

Included with the monitor is a short "operating manual," video cable and power cord.

For low to medium resolution graphics, the HX-12E is a solid performer. It produces brilliant colors with good resolution.

For additional information contact Princeton Graphic Systems, 601 Ewing Street, Princeton, NJ 08540; (800) 221-1490. ●

# COMMODORE

## PC 2 COM Project—A Commodore C-64/128 To PC/XT Interface

by Ted Drude

Anyone who has been even slightly involved with microcomputers over the last year or so has to be aware of the huge influx of IBM PC-compatible computers, called PC/XT-clones, that are flooding the market. With the price of some PC-clones priced competitively with similarly equipped C-128 systems, many C-64 owners are electing to upgrade to a PC-compatible clone when they are ready for a new system. As you know, when upgrading to a PC/XT-clone from a Commodore 64 or 128, the main problem you face is finding a use for your old system now that you've gone to a totally incompatible one.

### From Commodore to PC-Clone

If you're a new PC-clone owner, are somewhat technically competent, and would like to find a way to use your old C-64 along with your new machine, you may be especially interested in this month's column. We are announcing a very low cost, yet high performance, hardware link between a PC-compatible and your old C-64/128. This new interface standard is called PC2COM (an acronym for a PC-compatible to Commodore link). I don't think you will find anything quite like it, especially for the price. PC2COM will form the basis of some ongoing hardware projects in the future.

Although the primary emphasis of PC2COM will be on linking up to PC-compatibles, be aware that much of this project is also directly applicable to interconnecting C-64/128s to a wide variety of other computers. It's especially applicable to an Amiga to C-64/128 link (AMI264?). We may also expand the project to include the Amiga in the future.

### What is PC2COM?

The PC2COM project is an attempt to develop an interface standard. The intended link is between PC-compatibles and C-64/128s. The specific design goal states that it should be flexible, inexpensive, simple, and yet fast. The final end objective is to link a C-64/128 to a PC/XT-clone and then use it as an 8 bit co-processor (a term used rather loosely here) within the PC environment.

The announcement of the PC2COM standard isn't really going to herald a major breakthrough in computer technology. Actually, the technical details are rather mundane, compared to some other interface standards. It's basically a bi-directional parallel bus between two ports, with some handshaking and software thrown in for good measure. But it's design goals make it unique in several ways from existing interface options.

Also, PC2COM isn't a plug-and-go system (yet). Our purpose, rather, is to open up the creative doors for you, our readers. It's more like a path for some hardy pioneers to start treading down. While PC2COM may not be for the masses, remember, those who are the pioneers are also usually the leaders in the future. We want to define a standard method of assisting the inevitable: using the refined technology of the past to interface with the increasing affordable technology of the present and future. If we succeed at that, then PC2COM will be a useful tool in the transition.

The potential uses for this type of inexpensive interface is almost limitless. Many ideas come to mind (some of which you'll see shortly). One of the most obvious is using your C-64 for a custom printer interface and text buffer. That way, you can use your old Commodore printer with your new PC-clone. Although the PC2COM interface can be adapted to this type of application, it's really not much of a challenge for it. (Even so, we're planning on presenting such a software driver program that will work with PC2COM in the near future.)

PC2COM attempts much more ambitious things than just a simple one-way printer interface and buffer. It's a complete bi-directional parallel data bus with hardware handshaking, sender/receiver, and high speed transfers. The hardware and software are flexible enough that you can adapt it to many different tasks.

For example, an eventual goal of PC2COM is to implement bi-directional file transfers between the Commodore and PC-clone disk systems. Have you got a lot of data you want to transfer from one system to the other? When it comes to speed, PC2COM makes using the RS-232 interface like riding a unicycle up a hill!

### PC2COM: A System for Creative Applications Unlimited

An essential requirement of PC2COM is that it be an open system allowing end users to adapt it for their individual needs. PC2COM was designed, on purpose, to be an open system, and we are counting on you, our readers, to take PC2COM, use it in your own applications, and then share some of your ideas with the rest of us. Sort of like a public domain interface, if you please.

In order to get your creative wheels churning, here are some ideas on how to use PC2COM: What about using a PC/XT-clone, and an inexpensive PC-bus hard disk drive, as a storage system for a huge Commodore bulletin board? How about using the C-64 as a call screener for a large PC bulletin board? Let the kids run education programs on the C-64 while you monitor their progress on the PC-clone? If you want to get wild with the software, why not try hooking up a PC/XT-clone as a new icon device for your 64 or 128 GEOS system?

And how about using the power and resources of the C-64 as a sophisticated dedicated controller system running a burglar alarm, home energy control panel, or even a manufacturing control system for your PC/XT-clone? You can let the C-64 run the system, poll the data sensors, and then interrupt your PC/XT-clone in case a problem arises. In the meantime, it can call the police, display an animated color display, or play a symphony. (Try finding a dedicated industrial controller for your PC with even half the power of a C-64!)

Of course, I won't even elaborate on the obvious possibilities of using a PC/XT-clone for C-64/128 software development, robotics applications, or advanced music synthesis. You could even use the PC/XT-clone to program the C-64's SID synthesizer chip, and do VIC II sprite animation, all in real-time with true multi-processor multi-tasking. By now, I'm sure that many of our readers have some ideas of their own!

Whoever comes up with some unique PC2COM applications, and submits them for publication, will probably find their ideas ending up in

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## Commodore CP/M-128 Column

by Cheryl Peterson

Once again my mailbox has been full of letters from folks offering help for others with CP/M problems. It always impresses me how helpful people can be once they know that others need their help. I had only one letter from someone asking for help.

Let's start with my latest letter from Gary Eide. As some of you may recall, Gary is offering disks containing the update programs needed to add the serial port addressing to CP/M Plus. At $5, these were a very good deal. Gary tells me that over 135 people responded to his offer. He also said he was very pleased that the readers were so considerate in their requests; including envelopes, addressed labels, and in some cases even disks along with the requested $5. I must say that you've all made me very proud of you.

Because of the good response to his offer, he has decided to add to the service. He is offering three more disks with the best public domain programs he could find. The disks are still $5 for the double-sided double-density ones. If you don't have a 1571, Gary will provide two 1541 format disks containing the same programs for $8.

If you'd like an updated list of the programs available send him a self-addressed stamped envelope with your request. He plans to increase the number of disks as he finds good programs.

As I said before, if you do decide to order from him, please make it as easy on him as possible. You could send a disk mailer (with or without disk enclosed) or include a sticky label with your address already printed on it. And it never hurts to say thanks.
Send to: *Gary Eide,*
N84W28452 Center Oak Rd.
Hartland, WI 53029

### More Public Domain

Another letter in my box brought information on an alternate source of public domain software.

I enjoy your CP/M-128 articles in *Computer Shopper*. I am enclosing a copy of a program catalog of CP/M-128 disks. I haven't ordered from them yet and the only experience I have had with them is that I sent them $2 for a catalog on 6/6/86 and finally received it on 8/20/86. (Also included was about 20 pages of other Commodore Vic-20, C64 even B-128 & PET programs.) If they will deliver, and at $5 per disk ($2.50 with their one-time special) it looks like a good deal. I thought this might be some information you could check out and be useful to the column.

A loyal reader, Bill Hopper

The offer he spoke of was a free disk for everyone you buy before 11/31/86. Mr. Hopper noted on the catalog that he was curious whether this "non-existent" date would even expire. The letter that came with the catalog apologized for the delay saying that it took so long because they were adding more disks to the list.

My initial reaction to this letter was "Oh boy, good news." After taking a look at the catalog I was tempted to not even mention it. Then I thought maybe I'd mention it and just not include the address.

Why?? All but one of the disks offered is labeled—FOG/EX1 ###. What this means is that they are selling the exact same disks offered by the First Osborne Group, in this case programs for the Osborne Executive computer. The disks are in 1541 format so they can be used by those who haven't yet bought a 1571. (I suppose there are still a few

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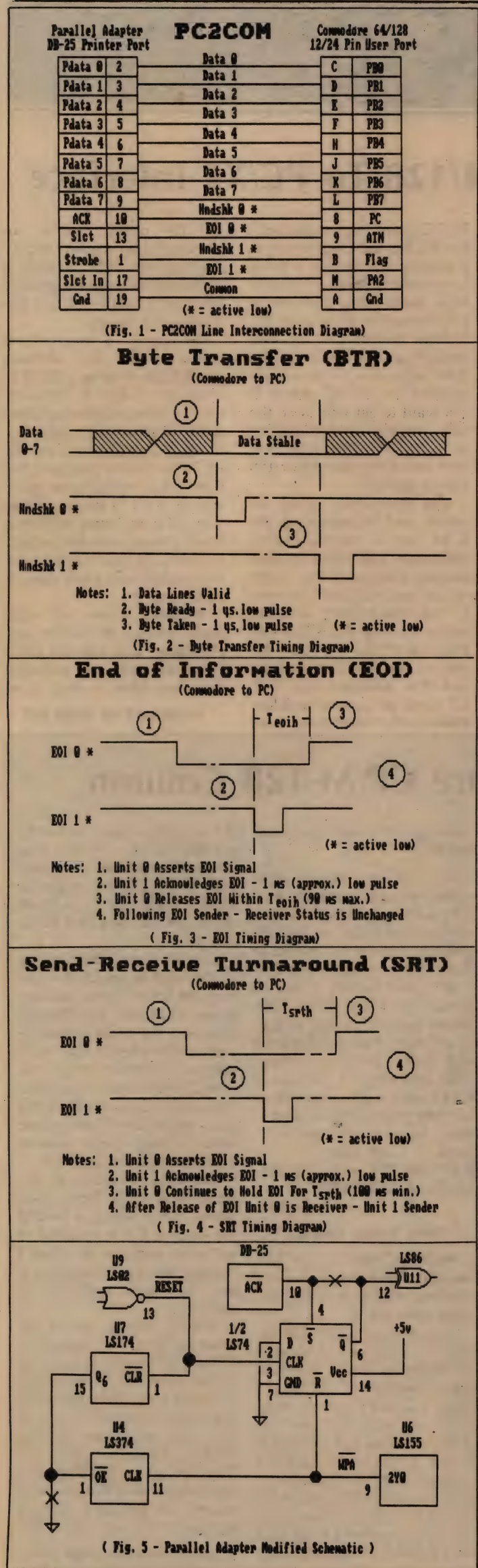


**PC2COM continued from page 101**

print, right here in our Commodore section. This could be a project that goes in a lot of different directions in the months ahead, both from our planned projects and reader's submissions. PC2COM belongs to us, and to you. Together, let's use it creatively.

### But Why PC2COM?

I could spend several more paragraphs trying to justify the existence of PC2COM, but I won't. By now you should have a fair idea of what we are trying to accomplish. Either you are interested in linking your old Commodore system to a PC/XT-clone or you aren't. If you're not interested, that's fine. Please, just ignore it, and read the parts of our Commodore section that you are truly interested in.

WE ARE NOT ABANDONING OUR COMMODORE COMMITMENT! (I had to write that in capital letters so everyone would see it!!!) If you don't like this project, please don't write me just to tell me how stupid I am for developing it. I've gotten plenty of reader feedback from readers who ARE interested in this type of interface, and it's for them that I've gone ahead with the development of it.

Please don't write me just to tell me how great Commodore is and if I was a TRUE BELIEVER I wouldn't even mention PC/XT-clones in this column. I already own three Commodores and know how great they are. I also know their limits, which is why I also own a PC/XT-clone, and partly why I developed PC2COM. I want to be able to use my C-64 for something besides a doorstop someday, and PC2COM is part of the anwer. (The other part is Commodore maintaining a lead in the low end and being competitive so we'll all continue to have neat new software like GEOS from time to time.) Enough Said! (I hope.) Now, to the description of the PC2COM interface (at last!).

### PC2COM: An Overview of The Interface

This section will describe the general considerations behind the development of PC2COM. I'm not trying to re-justify the existence of PC2COM here. Rather, I'm trying to give insight as to why the interface was designed as it is. Hopefully this will make it easier to understand the technical specifications.

This is also the start of a forum for discussion. (While I've told you a couple of reasons not to write me, now I'll tell why I would like you to write me.) Technically competent readers are encouraged to study the PC2COM standard and comment on it. (As always, please include a SASE if you want a direct reply to your comments.) If you have constructive comments to make towards improving the standard (or even changing it, within reason), please let me know. As I've said before, PC2COM belongs to all of us!

The general goals of PC2COM have already been stated several times, but here they are again: an inexpensive, flexible, simple, and fast hardware link between PC-compatibles and C-64/128s. For further clarification, let's discuss each of the general goals and see how they were met in the PC2COM specification. While each of the goals interrelates to a degree, you'll see that I've tried to highlight the main points in each section.

### Goal #1: KISS (Keep It Simple..... You Probably Know The Rest!)

While developing PC2-COM, there was one overriding factor that most often determined the appropriate direction of the project (besides low cost). That was heeding the simple admonition of the acronym KISS: Keep it Simple (Stupid)! While a data transfer interface is really just a straightforward design problem, many existing schemes insist upon adding level-upon-level of complexity to the basic theme. PC2COM is (hopefully) one of the least complicated transfer schemes devised, yet has the power needed for advanced operations.

### Goal #2: Speed—Parallel vs. Serial

Relatively slow speed RS-232 links are already available that could do most of the work of PC2COM. Although the PC-compatible serial port is capable of RS-232 rates of 9600 baud, the C-64 is limited (practically) to about 1200 baud maximum, without additional external hardware. It was decided that PC2COM must have a faster data transfer rate than the existing RS-232C options. (The need for more speed was one of the primary motivations behind PC2COM development.)

One option is to increase the C-64s RS-232 transfer rates. This requires an expansion bus card for the C-64 with an external hardware UART chip, and other necessary parts (crystal, level converters, connectors, etc.) An external UART board is incompatible with the existing KERNAL RS-232C routines, so special software drivers would also have to be written for it.

Because of cost considerations, and the lack of any real software advantage in using a high-speed serial link, it was decided to go with a parallel interface bus for PC2COM. This has several distinct advantages over an external RS-232 card. First, it's much less expensive, since it doesn't require a lot of extra hardware. (It can be implemented by using existing parallel printer ports, as we'll see shortly.) Second, since driver software will have to be written for the interface anyway, a parallel port is much less complicated to program. Third, when properly implemented, a parallel bus is significantly faster than even the fastest RS-232 port.

### Goal #3: Flexibility—Two Way Transfers, Not Just One

As we've already seen, if all we wanted to do with PC2COM was one-way parallel transfers (like a printer buffer), then all that's needed is a data bus and a couple of control lines. That's a relatively simple task. (PPD and the User Port Parallel Printer Cable are good examples of what's needed.)

But, if we want to be able to both send and receive data files from both computers, there's added complexity. We've also got to add some control lines and/or an arbitration procedure to decide who has control over the data lines. Also, we need a way of signaling end of data transfers. In other words, we've got to develop a hardware bus and a software protocol system.

There are already a couple of standard parallel bus interface protocols that need this criteria. Currently, the two most popular standard parallel interface buses are the IEEE-488, and the new darling in town: SCSI. We might have chosen to implement one of them on the C-64 for the PC2COM project. (And we thought seriously about it for some time.) While both of the buses offer a lot of power and features, they are also fairly complex, and would require much more external hardware, and thus more cost, on both the PC and C-64.

### Goal #4: Cost—KEEP IT CHEAP!!

When previously soliciting reader's comments about possible configurations for a PC2-COM-type interface, there was a common theme throughout: it MUST be as inexpensive as possible. A decision was made to keep any new hardware needed for the PC2COM interface under $50, if possible.

So, in order to meet all the above design goals, and especially to keep cost down, PC2COM is implemented us-

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# AMIGA

## The Amiga Workbench

by Ervin Bobo

At the end of the year it seems customary that those who write engage in retrospectives. Since those of us who write for the computer press spend most of our year looking forward—sometimes through a glass, darkly—we can probably be permitted this indulgence.

You see, I'm about to foist upon you my choices for the best Amiga software of the year—which also happens to be Amiga's first year—and I'll explain my reasoning as each piece is added to the list. However, I don't expect everyone to agree with me: for a magazine with the large circulation of *Computer Shopper*, I'd expect there are three or four of you who don't believe everything I write.

(As a matter of fact, we know exactly who you are and we are taking countermeasures. You've been warned.)

So, unlike other "Ten Best" collections, we're inviting your dissent—or your affirmation, whichever comes first. If you disagree with our choices, whether with all of them or only one, write and let us know about it. Include your reasons for disagreeing and we'll make the replies the subject of a future Workbench.

(Because it is the holiday season, traditional rules of amnesty apply and dissenters will not be added to our list.)

Before getting to the meat of the matter, it might be well to explain my ground rules. In order to illustrate the broad range of software available for the Amiga, I've tried to make my list non-repetitive. I consider both Deluxe Paint and Aegis Images to be super painting programs, but to name both of them to a limited list might mean that I'd have to ignore some other area of application. Therefore a decision must be made and it is such decisions of which arguments and fist fights are made.

Anyway, here goes:

**Best Painting Program:** Deluxe Paint from Electronic Arts. $99.95. It wins out over Aegis Images and Graphicraft, not necessarily for instrinsic values, but because it is the first to offer expansion capabilities in the form of an Art & Utility disk containing more images, more brushes and a version of DPslide which allows continous cycling through paintings while separating them with cuts, dissolves and fades.

**Best CAD Program:** Aegis DRAW. $199.95. At this writing, it is the only program for Computer Aided Design and that makes the choice easy. But when you work out an equation such as Value + Utility/Price, DRAW will hold it's own for a long time to come. In addition, we find it easy for even beginners to use and features such as Zoom and Layering make it possible to do complex drawings in a series of simple steps.

**Best Simulator:** Arctio Fox from Electronic Arts. $44.95. Although it is difficult to judge how well a program simulates something that has never existed, ARCTIC FOX wins hands down. The reasons lie in the smooth scrolling which soon convinces you that you're really on a large and continuous battlefield; superior sound effects in stereo, not just of explosions but of treads swishing on ice, crackling lightning and rolling thunder and radar interception devices. And best of all, 3-D effects that are truly 3-D. And we can't forget the on-screen hands that move to mimic the joystick and keyboard movements of your hands.

**Best Spreadsheet:** ANALYZE! from Micro-Systems Software. $99.95. Although VIP Professional works like Lotus 1-2-3 and thus probably "legitimizes" the Amiga for some, ANALYZE makes use of the best features of the computer: memory partitioning, multi-tasking, pull-down menus. In addition, it uses sparse-matrix technology so that blank cells consume no disk space.

**Best Word Processor:** TEXTCRAFT by Commodore Business Machines $99.95. Write Hand comes in as a combination of Wordstar and PFS Write; while Scribble! offers extensive formatting capabilities. But TEXTCRAFT, in it's use of graphics, icons, what-you-see-is-what-you-get format, extensive Help and better implementation of the Intuition interface is the better expression of reasons for having an Amiga. The single disk also contains versions for 256K and 512K machines, a trend other software producers are beginning to emulate.

**Best Printing Program:** DELUXE PRINT from Electronic Arts. $99.95. Again, there is no competitor in the category, making my selection easy. In PRINT, your work is visible at all times as you add or subtract images, borders and text in several fonts. Images and text can also be resized, dragged and rotated for precise placement and, prior to printing, you can size the entire work according to your needs. That it does all this in color is a tribute to the Amiga. That it does as well on black and white printers makes it the best available for any computer.

**Best Game:** MIND WALKER from Commodore Business Machines. $49.95. Though Commodore has removed itself from software development (this one was done by Synapse) their judgement as to the few they will market is so far impeccable. MIND WALKER treads a narrow line between game and art form, combining challenging play and batty logic with colors, shapes and stereo sounds that make you feel all of Amiga's separate parts are working together for the first time. I keep wishing I had had this as a demo during the Amiga launch, for it would have completely stifled those who only come out of their burrows to sneer at new computers.

**Best Database:** MIAMIGA FILE from SoftWood. $99.95. Again the field is small, though crowded with vaporware. InfoBase is written in AmigaBasic and must be taken though a tiresome installation. MIAMIGA FILE wins because of speed and because of it's two displays; one of which is an individual record, the other of all records. Drawbacks are limited math and reporting: it was never made for business use and as long as you understand that, you'll probably be happy with it. Another plus is a combination of colors (black on fawn) that result in the sharpest display of any productivity program we've seen.

**Best Communications:** ONLINE! by Micro-Systems Software. $69.95. This is a category that was quickly glutted by public domain programs. ONLINE! wins for ease of use, implementation of the Intuition interface, support of all popular protocols and it's ability to create script files for automatic logon. It also contains a built-in script file for

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## Lattice C On The Amiga

by Ronald Bobo

Although two C language compilers for the Amiga exist as of this writing, Lattice C, sometimes referred to as Amiga C, was the first available and carries the official Commodore sanction.

While earlier versions of Lattice C for the Amiga admittedly had some bugs, Lattice has continued to release new updates with bug fixes. The latest release, as of this writing, is Version 3.03C.

The manual for this compiler is printed on 8½" x 11" sheets, stapled together and punched for a three-ring binder. The cover is printed on a heavier stock, so the manual can be used without a binder.

Divided into six sections and three appendices, this manual is *not* intended as a tutorial or instruction manual for the C language.

Section 1 covers the introduction and basic concepts.

Section 2, Language Definition, covers differences from previous versions, major language features, comparison to the Kernighan and Ritchie C Reference Manual and new language features.

Section 3 covers standard library functions, with one function definition per page. One needed feature which is, sadly, lacking would be an index to the functions, which are not presented in strict alphabetical order.

Section 4 covers the how-to of compiling and linking a program under Amigados.

Section 5 addresses the subject of 68000 code generation, and Section 6 covers the Amigados System Interface.

Appendix A is a listing of error messages, Appendix B covers compiler errors and Appendix C is a list of files included on the compiler disk.

Although Lattice C adheres closely to the Kernighan and Ritchie definition of the C language as set forth in their book, *The C Programming Language*, some additions have been made to incorporate later additions to the language. (K & R was published in 1978.)

Efforts are now underway to define an ANSI standard for the language but many proposed new features are not yet firmly agreed upon. Therefore, Lattice has chosen to support only one of the new language features; an argument type-checking mechanism to aid in debugging, which is not fully compatible with the proposed standard.

Users of previous versions of Lattice C on other computers (the Amiga started out with Version 3) will be interested in the following major changes in Version 3:

1. The reserved symbol *unsigned* may be applied to any of the integral data types.
2. The special type *void*, describing a function with no return value, is now supported.
3. Enumerated data types are now supported using the special type *enum*.
4. Structures and unions, if of the identical type, may be copied by means of an assignment statement.
5. Passing of structures and unions, by value, to functions is allowed, as is the return of a structure or union from a function as a function value.
6. Declaration of external functions may be done with a list of type names enclosed in the function call parentheses. The compiler will then check these arguments against the expected types and number of parameters. In the event of a discrepancy, a warning message is issued.
7. Corrections have been made in the case of some minor deviations from the standard language, as follows; the compiler no longer accepts the dollar sign ($) in identifiers; nested comments are not allowed; multiple character constants will not be accepted;

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**Amiga Workbench**
**continued from page 103**

calling and logging on to the Micro-Systems BBS in case you need help.

**Best Presentation Program:** DELUXE VIDEO from Electronic Arts. $99.95. Although there is a strong contender in Aegis Animator, we feel that DELUXE VIDEO offers more capabilities with its greater library of parts, the ability to easily incorporate sounds and music into a script, a more flexible handling of text and the ability to create "run-time" disks for distribution to Amigas that may not have access to the parent program.

**Best Hardware Product:** 1 MEG MEMORY EXPANSION from C Limited. (aMega) $549.95. If you heard that Cardco has gone under, you heard right. Although we won't go into details, their demise was brought about by the failure of another company who owed them a great deal of money, not by anything Cardco management did or did not do. And all this is by way of introducing the good news that Ed Lippert, Cardco's president, kept the Amiga expansion alive by forming C Limited. Unlike other memory expanders, this one uses socketed D-RAM chips that are user replaceable so that a bad chip is not an occasion for a factory repair. Because it is powered from the Amiga, Commodore recommends no more than two such devices in tandem; Lippert tells me he has run four with no problems, though five will get squirrely. At a suggested list price of only $549.00, the C Limited 1 MEG EXPANSION BOARD should become the most sought-after Amiga hardware product.

**Best Educational Software:** DISCOVERY by Micro Illusions. $49.95. Though the game play will reveal itself to older Commodore users as an updating of Cave of the Word Wizard, this is no detriment for Cave was a solid piece of software. Completely rewritten for the Amiga, the action now takes place in a spaceship. Objectives and hazards are the same as before, but DISCOVERY takes full advantage of the Amiga traits in offering excellent animation, very smooth scrolling of the screen, speech and a delightful musical score and is available in both math and spelling versions.

**Best Music Program:** THE MUSIC STUDIO from Activision. $49.95. Once again, there are few contenders in a field distinguished by vaporware. At the launch of the Amiga, many versions of musical programming were promised but so far we've seen only two: STUDIO and Instant Music. Although Instant Music is interesting for the MouseJam feature, and Musicraft allows you to play the computer keyboard, MUSIC STUDIO wins by being more complete, by being able to support up to fifteen instruments at once, making it possible to compose for an orchestra rather than a combo; and because of it's Sound Room feature which allows you to design and save your own instruments.

**Best New Application:** INFOMINDER from Byte by Byte Software. $89.95. This is a category about which I expect some arguments for the field is almost as broad as the Amiga software base: because the computer has been in the field only a year, many of the programs available represent new applications.

Whereas other programs have moved the Amiga in new directions, in a sense redefining it, INFOMINDER gives us a chicken-and-egg scenario in that it also used the Amiga to redefine the database. Completely mouse-driven, INFOMINDER uses a hierarchical file structure that can be expanded and contracted like the files in Flow or Thinktank. Here, however, the files are composed of pages of text or graphics or both, pointing out new directions in the handling of information.

The producers believe so strongly in this that they encourage the free distribution of files created with INFOMINDER, asking only that they be informed so that they may keep a central catalogue. If distribution for profit is your goal, other easy guidelines apply.

**Best Accounting Program:** FINANCIAL PLUS from Byte by Byte Software. $295.00. Again the field is small and we've not seen Rags to Riches IV, which is said to have been rewritten to take advantage of the Intuition interface. As matters stand, FINANCIAL PLUS takes the honors because on a single disk it contains General Ledger, Payables, Receivables, Payroll and the Write Hand word processor. Having everything on a single disk makes using the program much faster and the creation of common files easier. In addition, there is a shorthand way of going from the main menu direct to any module, bypassing all the submenus, another process that speeds up usage.

**Best Transported Game:** The Halley Project from Mindscape. $49.95. I use that term instead of "ported" by way of distinguishing those games that have been rewritten to take advantage of the superior graphics and sound capabilities of the Amiga. In THE HALLEY PROJECT, your spaceship has mass and velocity, as do the planets and satellites upon which you attempt to land. The challenges are constant and the educational values of the game never become overbearing. All navigation is by the constellations of the Zodiac and if you think it's easy to find Saturn, approach it at trans-light speed and slow to orbital velocity on the first try—think again.

**Best Shareware:** SCREEN DUMP (found on CompuServe). There are hundreds of freeware and shareware programs posted on bulletin boards all over the country and I've seen no more than several dozen of them. SCREEN DUMP was chosen from those I know because it is an extremely useful program that, until very recently, had no commercial counterpart.

The following categories are so small that no explanations need to be given: they are mentioned only to let you know that categories of Amiga software are growing:

BEST ARCADE ADAPTATION: MARBLE MADNESS from Electronic Arts.

BEST TUTORIAL: KEYBOARD CADET from Mindscape.

BEST ADVENTURE: MINDSHADOW from Activision.

BEST BUSINESS GRAPHICS: IMPACT from Aegis.

BEST IMPROVEMENT: UNICALC v1.10 from Lattice.

BEST TRANSITIONAL DEVICE: TRANSFORMER and the 5.25 inch disk drive from Commodore.

We could go on with this, but it's starting to become as silly as the Grammy awards, where half the prizes are given out before showtime because nobody is really interested in the winners anyway.

The true significance of this list is as a "Look how far we've come!" device. If you can remember the Amiga roll-out of only a year ago, you'll remember your dealer showed you "Robo City" and "Bounce." He may also have booted the Instruments demo disk; showed you the orangutang; demonstrated multi-tasking by running "Lines," "Dots" and "Squares" all at once. And of course you listened to the speech routine that proved the Amiga could talk in a monotone "just like a real computer."

And if you bought an Amiga at that time (I did) it was pure-

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**Lattice C**
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separate copies of string constants are generated for each instance of identical strings. These changes, however, may be forced to revert back to their old characteristics by means of a compile time option. Finally, *char* declarations can be forced to be interpreted as *unsigned char*.

Warning messages are now issued in the case of an *auto* variable being used in a context where it may not have been initialized, and in the case of a locally visible object defined but never used.

Programs, as with most C compilers, are written using an editor such as the Amiga Ed or, if available, the Lattice Screen Editor which has a special Error mode designed to aid in the debugging of Lattice C programs. A word processor may also be used, providing it has the capability of saving files in text format.

The Standard Library included with Lattice C contains a number of functions for memory management, I/O and system functions, string handling, transcendental math functions, etc. Unix conventions are adhered to as nearly as possible.

The function descriptions in the manual are grouped in sections by category of function, with a description of either a single function or two or more closely related functions per page.

Even within a category, functions are not listed alphabetically, as in the following example; page 3-22 contains descriptions of puts/fputs, 3-23 has scanf/fscanf/sscanf (which carries over to 3-24) and on page 3-25 we skip backward in the alphabet to printf/fprintf and sprintf.

Combined with the previously noted lack of an index, this can make searching for a particular function adventurous.

Perhaps one day Lattice will see fit to model the Amiga C manual after the excellent manuals now furnished with the MS/DOS version of their compiler.

The compiler itself consists of two executable files, LC1 and LC2.

Once the program is written, the first stage of the compiler is invoked by typing LC1 then the program name, which must end in the two characters ".c" as in the example given in almost all C texts, "hello.c." The command would be:

LC1 hello

(The ".c" part of the filename is not used when invoking the compiler.)

LC1 reads the C source file and produces an intermediate file identical in name except that the ".c" is replaced by ".Q" (providing, of course, that no fatal errors were present).

The next command would be:

LC2 hello

This causes LC2 to read the intermediate file and produce a binary file with the title "hello.o." After this, the intermediate file is deleted by LC2.

During a test of Lattice C against its only competitor at this time, Aztec C68K, and using the Sieve of Erathosthenes prime number benchmark, the files, after compiling and linking, were 4,900 bytes for Aztec as opposed to 15,252 bytes for Lattice.

Compiling and linking was done with Execute (batch) files, so times given are for the total operation.

Compile and link time was 3 minutes, 57 seconds for Lattice and 1 minute, 45 seconds for Aztec.

Time of execution for the Lattice and Aztec program versions had to be declared a tie. A difference of only three hundredths of a second could be detected, well within the margin for error. The program ran to completion in the quite respectable time of 5.8 seconds for both compilers. On a stock IBM, this program takes about 12 seconds to execute.

The slower time for compiling and linking with Lattice can be laid almost entirely to the Amiga linker, Alink, rather than to the Lattice compiler. A subsequent test using Blink, a replacement for Alink, resulted in a compile and link time of 2 minutes, 3 seconds. The size of the executable file produced by Blink was 14,684 bytes, a saving of 568 bytes over the Alink version. Another linking with Blink, this time using the NODEBUG option to suppress certain data, resulted in a file length of 14,380 bytes, for a further saving of 304 bytes.

NODEBUG suppresses any HUNK_DEBUG, symbol table information or hunk names in the final object file. According to the Blink manual, this is equivalent to running STRIPA on the final object file. (STRIPA apparently being one of the programs made available to developers by Commodore, but not available to mere mortals such as you and me.)

The Software Distillery, 235 Trilling Lane, Cary, NC 27511 has made Blink available for free distribution, and it is available on Compuserve and other information services and bulletin boards.

When it comes time to choose one compiler over another, more factors must be evaluated than speed of com-

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# Chip Specials

## RAMS

| | | | |
|---|---|---|---|
| 256K | (256K × 1) | 150 ns | 2.65 |
| 256K | (256K × 1) | 120 ns | 2.90 |
| 256K | (256K × 1) | 100 ns | 4.75 |
| 256K | (64K × 4) | 150 ns | 4.25 |
| 128K | (128K × 1) | 150 ns | 4.40 |
| 64K | (64K × 1) | 150 ns | 1.10 |
| 64K | (64K × 1) | 120 ns | 1.35 |
| 6264LP-15 | (8K × 8) | 150 ns | 2.95 |

## EPROMS

| | | | |
|---|---|---|---|
| 2732A | (4K × 8) | 250 ns | 4.05 |
| 2764 | (8K × 8) | 250 ns | 3.25 |
| 2764 | (8K × 8) | 200 ns | 3.75 |
| 27C64 | (8K × 8) | 200 ns | 5.05 |
| 27128 | (16K × 8) | 250 ns | 3.65 |
| 27256 | (32K × 8) | 250 ns | 5.25 |
| 27256 | (32K × 8) | 200 ns | 5.65 |

## PROCESSORS

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|---|---|---|
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| C8087 | 5 mHz | 115.00 |
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- PRINTER CARD ..... 16
- PARALLEL & SERIAL CARD ..... 27
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- GVC MODEM 1200bps CARD ..... 130

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- CHINON 1.2 FLOPPY DISK DRIVE ..... 110

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# TANDY COMPUTERS

## Dr. Dr. Zucker Does It Again! 20 Meg Hardcard for Tandy

by Lon Andrews

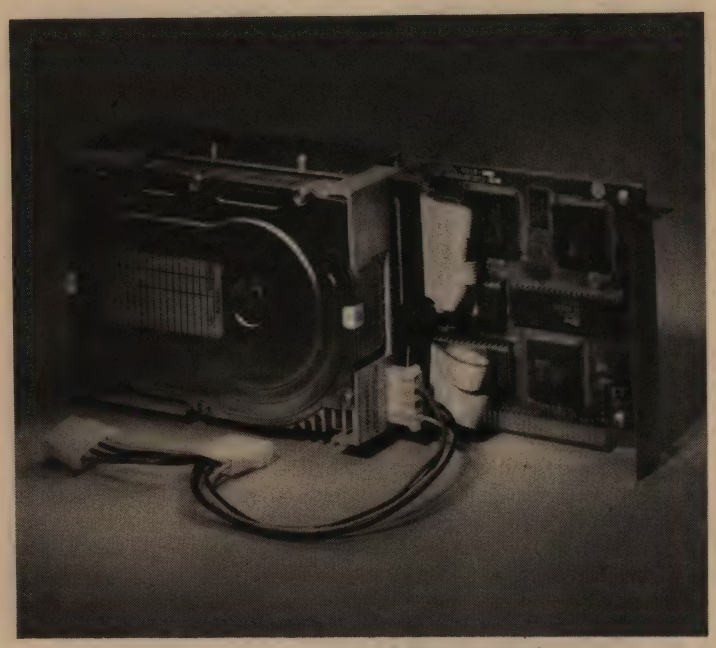
Dr. Dr. Zucker has become fairly well known for his less expensive memory expansion boards for the Tandy 1000. I reviewed one of them and ended up buying one for each of the 1000s that I work with at home and school. I am still pleased with them. More about the memory boards later on. For now it suffices to say that the quality of the memory boards prompted me to try the hard card.

When the hard card arrived I took some time to look it over before trying to use it. The unit itself is surprising, 20 Meg in that! No Way! But it is all there and not much bigger than a memory board. The documentation that came with mine was skimpy. A call to the good Dr. Dr. Zucker's residence (Advanced Transducer Devices) provided the information that the documentation was just coming in from the printer. They were in a hurry to get the unit to us to make deadline so they sent it on figuring that we would work it out. At first I was a little put off. We have had some bad times with Tandy 1000s and non Tandy hard drives. I think the most frustrated I have ever been over a computer was trying to format a hard drive in my 1000. It became a joke.

I have had calls from all over the United States wanting help with the same task. For this reason I was somewhat apprehensive when I began to install Dr. Dr. Zucker's hard card. To my complete and utter amazement it was not only as easy as ATD claimed, it was easier. Simply plug the card in the slot closest to the fan, plug the power connector to floppy drive B: and plug the power line from the computer into the connector from the hard card. Voila! It was finished, at least the easy part. Now for the formatting and so on...

Formatting is no problem. The hard card is shipped preformatted. End of that problem. It is, however, formatted for MS-DOS 3.0 and I have 2.11.22 from Tandy. There are several warnings about copying Command. Com (2.11) to the drive as it will destroy the boot program. I began to wonder if it would function on 2.11 at all after reading the info. It will, but you have to go through the format process which isn't really such a big deal after all.

Using the hard card is just as simple as using any hard drive. It is super quiet! I can't hear mine over the fan in the Tandy 1000. Some of the drives I have used sound like a siren. With both floppies in the computer, there is no outward sign that you even have a hard drive installed. You can't hear it and you can't see it but it works like a charm. The 3½ drive fits in the Tandy like a glove. The overhang of the drive capsule fits into the compartment next to the drive stands for the floppies so it doesn't interfere with the other slots.



Dr. Dr. Zucker's 20 Mbyte Hardcard.

The next question that pops up if you have been around the Tandy long is, "Why can't I

continued on page 271

## Master/Card For Memory, I/O, DMA

by Lon Andrews

I have been using the Master/Card (used to be MEGA-BOARD) for some time now and have nothing but praise for it as part of my Tandy 1000 system. It has never produced a single problem in all the hours I have had my system in use. That says a lot as my system runs most of the day, everyday of the week. Now there is some new and improved software available with the Master/Card.

The Master/Card is compatible with the Tandy Models 1000, 1000 A, and 1000 SX and will add up to 32 million bytes of memory to the system. It is compatible with Tandy's 256 add-on memory board and other Tandy compatible boards. A removable DMA controller is included with the board along with a clock and calendar. It has a configurable RS-232 serial port that can be set as COM1 or COM2, or disabled. A back-bank memory or RAM disk holds up to 3,932,160 characters that are not lost or destroyed when you reboot. The printer spooler (262,144 characters) works with parallel and serial printers. There is a Lotus/Intel/Microsoft Expanded Memory Emulator that is compatible with EMS version 3.20. The whole works is compatible with MS-DOS and PC-DOS versions 2.0 and up. To finish it off there is a section in the documentation giving full technical information for experienced programmers that want to take advantage of the Master/Card's banked memory.

Whew! That's a lot in one card but then the Master/Card is a lot of card. The board is well constructed and fits the Tandy with no stretching or pulling like some I have installed. Once the board is in the slot you are ready to use the new edition of the software.

When you boot the computer it should show 640K if not re-check your installation. There is a program on the distribution disk (MCTest.EXE) that will check the card and all the memory so you are sure that all is well. Use the MCInstal program to configure your system to use the full abilities of the Master/Card. It is simple. Just call the program and follow the prompts as they appear on the screen. When you are finished re-boot and watch as each program is loaded. If there are no error messages you are ready to go!

The documentation with the software is excellent. My copy is still in the printout stage as the printers had not completed the printing of the manual. Even at that it was an education to read the docs. Some of it was old hat but the majority of the manual will be high on my list of things to refer to for a long time to come.

I have used a RAM disk for word processing for a couple of years and I am delighted with the results. The only hazard is loss of power as you will lose it all unless you run a frequent backup to the floppy or hard disk. I have a backup power source so I don't worry. The Master/Card's memory disk doesn't use the main memory of the computer. The back banks of memory are used and unless you specify otherwise it will be 256K (⅔ the size of a floppy) in size. By specifying how many banks to use for the memory disk you can expand it up to fifteen back banks of 256K each.

Tired of waiting for the printer to finish so you can get on with your work? The SPOOLER program creates a section of the memory banks dedicated to the printer. Once it is activated the memory device captures all data sent to the PRN device and to LPT1, LPT2, LPT3, COM1, or COM2. Data is accepted at the rate of 40,000 characters a minute. The data is then sent to the printer at a rate that it can handle. Meanwhile you are back at work while the printer works.

Programs that conform to the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) can use the Master/Card through the EMS Emulator. This emulator uses either hi or low memory locations in the main memory as a window to the banked memory. Up to 32 banks of the card's memory can be dedicated to the EMS emulator. During the testing of the Master/Card's software a wide variety of applications software was used and none were found to be incompatible with the emulator program.

The authors of the software have included a sixteen page section in the documentation concerning programming to access the banked memory of the Master/Card. In order to do it justice I would have to reproduce it from front to back and the editor would have a fit if I turned in 16 pages of programming information. It is well written and easily understood if you are into programming. Coming soon is a new release from Matthews called the HELPER that will allow programs written in BASIC and a few specified language compilers to reserve and use the banked memory. The problem that exists now is that these languages have problems with the 8086/8088 interrupt calls. If you are interested contact Automation Facilities Corporation to reserve a copy.

I have yet to see anything from Matthews that is substandard. Their testing program is super and they are sure it works before you get it. If you are going to expand the capabilities of your 1000 be sure to look at the Master/Card. You won't be sorry.

Master/Card from $185 up. Automation Facilities Corporation, 6383 Rose Lane, Carpinteria, CA 93013; (800) 543-2233; (805) 684-5464. ●

# Screen Print Routine For TRS-80 Model I, III

by Robert Doerr

The assembly language program is written for the Radio Shack Model I or III, 16K to 48K. The BASIC program is written in Disk BASIC but should be easily modified for use without a disk system.

The assembly language program is a subroutine that is called by a USR call within a BASIC program. The subroutine is fast and efficient and can be easily modified to any printer that has internal block graphics. It uses only four graphic blocks (see Tables 1, 2 and 3 on page 270) to print the screen image to paper. The program calls for three passes on each of the sixteen lines of graphics and/or alphanumeric characters displayed on the screen.

The program is a good tutorial for those learning how to program in assembly language.

The origin address is FF00H for 48K systems (7F00H for 16K, and BF00H for 32K systems). In lines 70-100 (see Program Listing 1) the registers are saved to the stack so that when the routine is finished, our original program can continue from where it left off.

Line 110 loads HL with the first screen position and by later PUSHing it on the stack we save it for the three passes that are made for each line. B is originally loaded with 16 for the lines on the screen.

Lines 130-200 set the paper feed on the printer. If your printer has different commands for one-half line feed, then make adjustments here by loading A with the CHR$ commands. The OUTPUT swaps registers before calling the ROM routine to send the value in the A register to the printer; then exchanges registers to continue.

The main program begins with line 210. The line number count is placed on the stack on line 220 and the screen position is placed on the stack (230) for the second pass. Line 240 begins the first pass of 64 characters. Line 250 loads the accumulator with the contents of HL (first screen position) and now we get to the heart of the print routine.

The graphics character with its two by three formation is used in this BYTE configuration (see Table 2). Line 260

continued on page 270

**Listing 2**

```
1 ' Short draw program to demonstrate screen dump
2 ' Radio Shack line printers
5 CLEAR250:POKE16561,&HFF:POKE16562,&HFE: 'To protect memory
10 CLS:DEFINTA-Z:DEFUSR0=&HFF00
15 GOSUB11000 : 'Put printer routine into memory
20 X=0:Y=0
30 P=PEEK(14400)
35 A=PEEK(16537):IFA=80THENGOSUB200
40 I=PAND96:J=PAND24
50 H=SGN((I-63)*I):K=SGN((J-15)*J)
60 IFX+H<0ORX+H>127THEN30
70 IFY+K<0ORY+K>47THEN30
80 SET(X,Y):X=X+H:Y=Y+K
90 SET(X,Y):SET(127-X,Y)
100 SET(X,47-Y):SET(127-X,47-Y)
105 IFP=1I$=INKEY$:GOTO130
110 RESET(X,Y)
120 GOTO30
130 I$=INKEY$:IFI$=""THEN130ELSE10
200 X=USR(X): 'Call printer routine
205 POKE16537,70: 'To avoid repeat
210 RETURN
11000 FORI=-256TO-119 :'Start and end addresses
11010 READN:POKEI,N
11020 NEXTI
11030 RETURN
12000 DATA245,197,213,229,33,0,60,6,16,62,27,205,128,255
12010 DATA62,28,205,128,255,62,13,205,128,255,197,229,6,64
12020 DATA126,203,127,32,7,62,224,205,128,255,24,3,205,116
12030 DATA255,35,16,238,62,13,205,128,255,225,229,6,64,126
12040 DATA203,127,32,5,205,128,255,24,5,31,31,205,116,255
12050 DATA35,16,238,62,13,205,128,255,225,6,64,126,203,127
12060 DATA32,7,62,224,205,128,255,24,7,31,31,31,31,205
12070 DATA116,255,35,16,234,62,13,205,128,255,193,16,169,225
12080 DATA209,193,241,201,230,3,229,95,22,0,33,134,255,25
12090 DATA126,225,217,205,59,0,217,201,224,233,234,239
```

**Listing 3**

```
1 ' Short draw program to demonstrate screen dump
2 ' Gemini-10x and 15x line printers
5 CLEAR250:POKE16561,&HFF:POKE16562,&HFE: 'To protect memory
10 CLS:DEFINTA-Z:DEFUSR0=&HFF00
15 GOSUB11000:'Put printer routine into memory
20 X=0:Y=0
30 P=PEEK(14400)
35 A=PEEK(16537):IFA=80THENGOSUB200
40 I=PAND96:J=PAND24
50 H=SGN((I-63)*I):K=SGN((J-15)*J)
60 IFX+H<0ORX+H>127THEN30
70 IFY+K<0ORY+K>47THEN30
80 SET(X,Y):X=X+H:Y=Y+K
90 SET(X,Y):SET(127-X,Y)
100 SET(X,47-Y):SET(127-X,47-Y)
105 IFP=1I$=INKEY$:GOTO130
110 RESET(X,Y)
120 GOTO30
130 I$=INKEY$:IFI$=""THEN130ELSE10
200 X=USR(X): ' Call printer routine
205 POKE16537,70: 'To avoid repeat
210 RETURN
11000 FORI=-256TO-114 :'Start and end addresses
11010 READN:POKEI,N
11020 NEXTI
11030 RETURN
12000 DATA245,197,213,229,33,0,60,6,16,62,27,205,133,255
12010 DATA62,65,205,133,255,62,6,205,133,255,62,13,205,133
12020 DATA255,197,229,6,64,126,203,127,32,7,62,224,205,133
12030 DATA255,24,3,205,121,255,35,16,238,62,13,205,133,255
12040 DATA225,229,6,64,126,203,127,32,5,205,133,255,24,5
12050 DATA31,31,205,121,255,35,16,238,62,13,205,133,255,225
12060 DATA6,64,126,203,127,32,7,62,224,205,133,255,24,7
12070 DATA31,31,31,31,205,121,255,35,16,234,62,13,205,133
12080 DATA255,193,16,169,225,209,193,241,201,230,3,229,95,22
12090 DATA0,33,139,255,25,126,225,217,205,59,0,217,201,224
12100 DATA233,234,239
```

**Listing 1**

```
                00010 ; TRS-80 Screen print routine for Radio Shack
                00020 ; and Gemini-10x Line Printers.
                00030 ; Written by Robert Doerr
                00040 ; Change ORiGin address to 7F00H in 16k system. (Mem=32511)
                00050 ; Change ORiGin address to 0BF00H in 32k system. (Mem=48895)
FF00            00060          ORG     0FF00H          ;48k machine (Mem=65279)
FF00 F5         00070 SCREEP   PUSH    AF              ;Save registers
FF01 C5         00080          PUSH    BC              ;for return to original
FF02 D5         00090          PUSH    DE              ;program
FF03 E5         00100          PUSH    HL
FF04 21003C     00110          LD      HL,3C00H        ;Screen location
FF07 0610       00120          LD      B,16            ;Sixteen lines
FF09 3E1B       00130          LD      A,27            ;Set paper feed to 1/2 line
FF0B CD85FF     00140          CALL    OUTPUT
                00145 ; For Radio Shack printer delete lines 150-170 and add 160  LD  A,28
FF0E 3E41       00150          LD      A,65            ;Values for Gemini-10x
FF10 CD85FF     00160          CALL    OUTPUT
FF13 3E06       00170          LD      A,6             ;and Gemini-15x printers
FF15 CD85FF     00180          CALL    OUTPUT
FF18 3E0D       00190          LD      A,0DH
FF1A CD85FF     00200          CALL    OUTPUT
                00210 ; Main loop (each loop prints one line from screen)
FF1D C5         00220 LINELP   PUSH    BC              ;Save loop count
FF1E E5         00230          PUSH    HL              ;Save screen position for 2nd pass
FF1F 0640       00240          LD      B,64            ;First pass
FF21 7E         00250 TOPLIN   LD      A,(HL)          ;Get CHR$ value
FF22 CB7F       00260          BIT     7,A             ;Check for graphics character
FF24 2007       00270          JR      NZ,GETGR1       ;If it is, print graphics
FF26 3EE0       00280          LD      A,224           ;else a space
FF28 CD85FF     00290          CALL    OUTPUT          ;Print the space
FF2B 1803       00300          JR      CONTN1          ;Jump to next screen position
FF2D CD79FF     00310 GETGR1   CALL    PRTCHR          ;Graphics routine
FF30 23         00320 CONTN1   INC     HL              ;Next screen position
FF31 10EE       00330          DJNZ    TOPLIN          ;Continue until pass done
FF33 3E0D       00340          LD      A,0DH           ;Load carriage return
FF35 CD85FF     00350          CALL    OUTPUT          ;Print carriage return
FF38 E1         00360          POP     HL              ;Get begining of line
FF39 E5         00370          PUSH    HL              ;Save it for 3rd pass
FF3A 0640       00380          LD      B,64            ;Second pass
FF3C 7E         00390 MIDLIN   LD      A,(HL)          ;Get CHR$ value
FF3D CB7F       00400          BIT     7,A             ;Check for grapics character
FF3F 2005       00410          JR      NZ,GETGR2       ;If is it, print graphics
FF41 CD85FF     00420          CALL    OUTPUT          ;if not, print alphanumeric
FF44 1805       00430          JR      CONTN2          ;Jump to next screen position
FF46 1F         00440 GETGR2   RRA                     ;Adjust bits two places
FF47 1F         00450          RRA                     ;to the right
FF48 CD79FF     00460          CALL    PRTCHR          ;Graphics routine
FF4B 23         00470 CONTN2   INC     HL              ;Next screen position
FF4C 10EE       00480          DJNZ    MIDLIN          ;Continue until pass done
FF4E 3E0D       00490          LD      A,0DH           ;Load carriage return
FF50 CD85FF     00500          CALL    OUTPUT          ;Print carriage return
FF53 E1         00510          POP     HL              ;Get 1st screen position
FF54 0640       00520          LD      B,64            ;Third pass
FF56 7E         00530 BOTLIN   LD      A,(HL)          ;Get CHR$ value
FF57 CB7F       00540          BIT     7,A             ;Check for graphics
FF59 2007       00550          JR      NZ,GETGR3       ;If it is, print graphics
FF5B 3EE0       00560          LD      A,224           ;If not, load space
FF5D CD85FF     00570          CALL    OUTPUT          ;Print space
FF60 1807       00580          JR      CONTN3          ;Continue
FF62 1F         00590 GETGR3   RRA                     ;Adjust bits
FF63 1F         00600          RRA                     ;four places
FF64 1F         00610          RRA                     ;to the right
FF65 1F         00620          RRA
FF66 CD79FF     00630          CALL    PRTCHR          ;Print graphics
FF69 23         00640 CONTN3   INC     HL              ;Next screen position
FF6A 10EA       00650          DJNZ    BOTLIN          ;Continue until pass done
FF6C 3E0D       00660          LD      A,0DH           ;Load carriage return
FF6E CD85FF     00670          CALL    OUTPUT          ;Print carriage return
FF71 C1         00680          POP     BC              ;Restore loop count (16)
FF72 10A9       00690          DJNZ    LINELP          ;Continue with main loop
FF74 E1         00700          POP     HL              ;Restore registers
FF75 D1         00710          POP     DE              ;before returning
FF76 C1         00720          POP     BC              ;to Main Program
FF77 F1         00730          POP     AF
FF78 C9         00740          RET                     ;And leave.
FF79 E603       00750 PRTCHR   AND     3               ;Get last 2 bits
FF7B E5         00760          PUSH    HL              ;Save HL register
FF7C 5F         00770          LD      E,A             ;Load 2 bits in E
FF7D 1600       00780          LD      D,0             ;Complete register pair
FF7F 21BBFF     00790          LD      HL,TAB          ;Point to table
FF82 19         00800          ADD     HL,DE           ;Point to character in table
FF83 7E         00810          LD      A,(HL)          ;Get Graphic character from table
FF84 E1         00820          POP     HL              ;Restore HL register
FF85 D9         00830 OUTPUT   EXX                     ;Swap HL, DE, and BC
FF86 CD3B00     00840          CALL    3BH             ;Print character in A register
FF89 D9         00850          EXX                     ;Swap HL, DE, and BC
FF8A C9         00860          RET                     ;And return
FF8B E0         00870 TAB      DEFB    224             ;Graphic data (0-3)
FF8C E9         00880          DEFB    233
FF8D EA         00890          DEFB    234
FF8E EF         00900          DEFB    239
FF00            00910          END     SCREEP          ;Entry address

BOTLIN      FF56 CONTN1     FF30 CONTN2     FF4B
CONTN3      FF69 GETGR1     FF2D GETGR2     FF46
GETGR3      FF62 LINELP     FF1D MIDLIN     FF3C
OUTPUT      FF85 PRTCHR     FF79 SCREEP     FF00
TAB         FF8B TOPLIN     FF21
00000 Total errors
```

# Apple IIGS Receiving Third Party Support

During its initial rollout, Apple Computer's new Apple IIGS personal computer will have the advantage of a substantial selection of software packages and hardware add-ons from independent developers.

The system is designed to be compatible with the thousands of productivity, educational and entertainment programs developed for earlier Apple II models, as well as the majority of peripherals and expansion cards designed for those machines. In addition, Apple has worked with over 250 companies during the past six months to foster development on the IIGS. More than 40 new products are available now, and Apple anticipates that this intense development pace will continue for several years.

"The release of a new computer at Apple means an enormous effort to involve the third-party development community," said Guy Kawasaki, manager of software products. "We strive for the best balance of backward compatibility and radical new capabilities. The IIGS achieves this better than any system Apple has ever developed."

"The developers who worked with us greatly influenced the final graphic, sound, and processing capabilities of the IIGS. Apple has delivered the Apple II that developers dream about," Kawasaki said.

### IIGS Adapts Graphic User Interface

Most new software programs feature a graphic user interface with pull-down menus, windows, icons, and multiple fonts. The IIGS contains in ROM QuickDraw routines that are similar to the Macintosh. This capability, combined with the IIGS' huge color palette and super high resolution mode, have inspired an array of products that utilize graphics in innovative ways.

Free-form painting programs, such as Paintworks Plus from Activision, allow the user to create his or her own artwork using the mouse and palettes of colors, shapes and fill patterns.

New structured graphics programs, including TopDraw from Styleware and an updated version of The Printshop from Broderbund, manipulate boxes, circles and shapes and provide libraries of color clip-art for creating charts, graphs, fliers, maps—even greeting cards.

Entry-level desktop publishing programs, such as Newsmaker from Broderbund and Pageworks from Megahaus, let the Apple II user lay out professional-looking newsletters and print them on Apple's Imagewriter or LaserWriter printer.

Animation—with graphics and sound that approach professional quality—is possible on the IIGS using software such as the updated version of Fantavision from Broderbund.

Educational and entertainment programs also are more appealing and effective because of IIGS graphics. New and revised programs include Puppy Love from Tom Snyder Productions, Explore-a-Story from D.C. Heath and Co. from Silent Service from MicroProse.

To augment the large number of existing Apple II productivity packages, developers are introducing new products that leverage the IIGS' 16-bit microprocessor and large internal memory for additional speed and power. Many also incorporate a Macintosh-like interface. New and revised products include MultiScribe, from Styleware, Writer's Choice Elite from Activision, MouseWrite from Roger Wagner Publishing, WordPerfect, VIP Professional, and others.

Several packages for specialized home and school productivity tasks will also be available immediately for the IIGS, including an updated version of Managing Your Money from MECA, and a program for classroom administration from Chancery Software Ltd.

A variety of software packages and add-on devices highlight the sound-generation capabilities of the IIGS, and Apple anticipates the release of many more products that generate or complement sophisticated music and voice sounds. To aid in development, Apple recently released to developers sound tools that allow software to play instrument tones on a note-by-note basis.

Sound products include the Echo IIb from Street Electronics, a plug-in board for adding speech to software programs; Talking Text Writer from Scholastic Software, a program for teaching reading and writing; Kid's Time II from Great Wave Software, which consists of two educational programs for teaching music and keyboard skills; four talking educational software packages from First Byte, Inc.; and RoomMates speakers from the Bose Corp.

### Hardware Also Developed for the IIGS

A number of well-known developers, including AST Research, Inc., A-Squared, MDIdeas Inc., Peak Systems, Orange Micro Inc., Applied Engineering, General Computer and ProAPP Inc., are taking advantage of the ports and memory expansion capability of the IIGS and introducing new or revised memory cards, storage subsystems and back-up products.

Two new video digitizers include: a video frame-grabber from A-Squared that provides black-and-white and colorization processing, and operates at 20 frames per second; and AST Research Inc.'s graphics video digitizer, which provides real-time color and black-and-white image processing, in addition to special effects features.

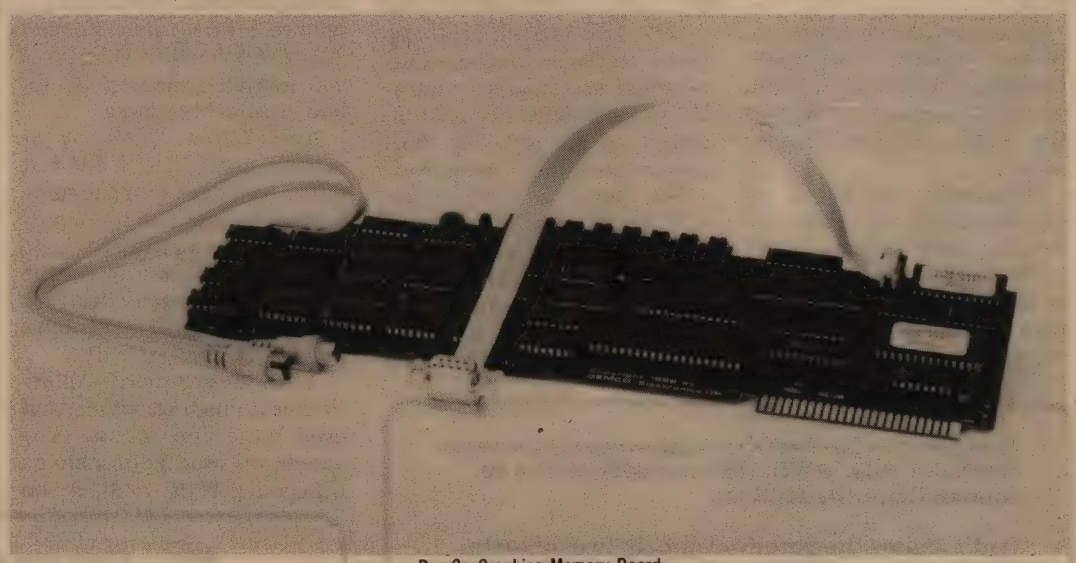
Other new hardware products include: a parallel printer interface from Orange Micro Inc. that provides innovative options for printing graphics directly from the IIGS screen; an internal 1200 bps modem from Hayes; an IBM PC-like keyboard from DataDesk International; a graphics tablet from Kurta Corp.; and a stereo card from MDIdeas, Inc.

### Compatibility Retained

In addition to this selection of new third-party products, IIGS purchasers also will be able to choose from the thousands of existing Apple II software packages and peripherals. This will particularly benefit those who upgrade to the IIGS from older Apple IIs, such as schools, which have huge investments in software and peripherals. Consumers, too, stand to benefit from the design of the IIGS, which contains a microprocessor compatible with the IIe and IIc and near-

continued on page 224

# The Graphics Tool Kit



DemCo Graphics Memory Board

DemCo Electronics has released a versatile graphics system designed for the Apple II series of computers: The Graphics Tool Kit.

The hardware displays the complete width and half the height of an 8½" by 11" drawing. Since the hardware stores the complete drawing in memory, and allows for automatic scrolling to the second half, a full page of graphics can be dumped to most dot matrix printers. The board allows for any one of eight 640 x 384 screens of high-res graphics to be instantly displayed. The hardware also has a 100% Apple compatible mouse port built into the board. With all these hardware features, power consumption is kept to a minimum by making maximum use of ultra low power CMOS ICs where possible.

Included in the kit is a graphics design package similar to MacPaint on the Macintosh. Some unique features of the software are: automatic windowing; variable grid lock; draw options accessible from a POP over bar menu; text insertion in four directions; proportionally spaced fonts; block functions such as fat bits, move, rotate, flip, duplicate, invert, and cut/paste.

The system is configurable for most popular dot matix printers and interface cards. A quality print mode (160 dots/inch) and full 11" by 14" printouts are supported on printers with these capabilities.

The software package also contains fonts and a font maker/editor, vector shapes and a shape maker/editor, many useful basic programs, sample pictures, and clip art.

List price: $395
Requires: Apple II +, IIe, IIgs or compatibles

For additional information contact DemCo Electronics, 10516 Grevillea Avenue, Inglewood, CA; (213) 677-0801

Mention that you read about it in *Computer Shopper*. ●

# Ask The Guru

by Don Lancaster

Well, I bet you thought last month's column would be a very hard act to follow. Not so. This month, behind the mauve curtain, we have our biggest blockbuster ever. How about real ink in stunning full color out of your stock and unmodified Laserwriter? Using AppleWriter on an Apple IIe, of course, helped along by my utilities. And all sanely priced to boot.

But first, let's fire up the rumor mill. We'll set it to a medium fine grind.

There is now a major new source for Apple developer insider information. And it is open to anyone anywhere.

Check into the new Apple Programmer's and Developer's Association. Membership is $20 per year, and it gives you instant access to all of the technical manuals, third party new programs, some beta test goodies, and much more.

The APDA is run by the CALL A.P.P.L.E. people, who publish one of the top three Apple magazines. The other two, of course, are Open Apple and Apple Assembly Line. Nothing else even comes close.

Available are development tools, system software, technical notes and data, manuals, languages, and even the Apple Addison-Weseley library.

Apparently the IIc liquid crystal display flat screen option has been flushed.

Mostly because it was totally illegible, I guess. But that does not seem to slow down the competition, whose flat panel displays are all completely unreadable under any and all known lighting conditions.

I'm not convinced there is any market at all for fully and truly portable computers until such time as the display legibility, system performance, and battery life hassles can be fixed.

The IIc now has a new circuit board that includes plug-in memory expansion up to one megabyte of RAM. Check your Apple dealer for more info on upgrades and such.

Let's see. My free stuff list has just been updated, so write or call for your personal copy. We are now shipping the prerelease of our Appleworks Disassembly Script, as well as stocking Adobe's Postscript books as a service for all of you *Computer Shopper* readers.

And, our usual reminder that this is your column and you can get technical help by calling the number in the end box.

But now...

### What Is The Latest Word On The IIgs?

Lots of news on this exciting new machine. Yes, there is an internal game paddle connector. This is handy for very old paddles and joysticks, and also gives you the annunciator outputs that are superb for ultracheap local networks or to interface to an ultrasonic BSR power controller or whatever.

No, there is no provision for a RF modulator. The old four pin internal connector is gone, and the IIc external modulator will not fit. Not that a RF modulator would do you much good anyhow. Direct antenna entry of a stock color TV set would hopelessly smear 80 column color text, besides trashing the new super HIRES modes.

Speaking of which, Apple's new color monitor is absolutely stunning. Not only is the 80 column color text fully legible, it is actually pleasant to use with your full choice of text, background, and border color. This is the first time I have ever seen a 80 column color text display that I would actually be willing to use.

There is also a brand new plug-in SCSI interface card available and ready to go.

Which removes once and for all the paltry IIgs limit of a mere 128 disk drives of a pitiful five gigabytes each.

The IIgs bugs are starting to pour in. Naturally, any new machine will have at least some teething problems, and the IIgs is no exception.

That 90 percent compatibility claim is a pipe dream. Even AppleWriter and Appleworks have problems. Version 1.3 of AppleWriter will not let you use an expansion RAM card on the IIgs, so you are stuck with 55K. It also gives you a garish tweet instead of the usual buzz in the fast mode. Apple did announce a brand new Version 2.0 of Appleworks that gives you extended memory access and reasonable tones.

AppleWriter works ok at normal speed, but in the fast mode, you have to make some patches to keep the tones normal, the cursor flashing rate under control, and to set the proper intercharacter delay for serial printing. I will have patches on these shortly.

At the faster speed, AppleWriter is much smoother, and even more fun to use. The speedup is most noticeable on things like WPL routines, on long searches, and on the reformatting that takes place after disk access.

Very nice.

There seems to be a problem with the power supply. The rundown time is way over 30 seconds. The good news here is that you can coast through more and deeper power line glitches without any problems. The bad news is that you can zap a board if you insert or remove it within half a minute of turning the power off.

So, be sure to wait at least 40 seconds after power down before you make any card changes in your IIgs.

There are also some severe hard disk problems.

Some disks, particularly the ProFile, will lose data or else plow themselves in the fast mode. For now, do not use an older hard disk with the IIgs, until this problem is fixed.

Some early IIgs machines tend to have sound that sits there muttering to itself. While this sound level is very low, it could drive a "night person" up the wall if he is working in a totally silent room.

Some routines actually seem to mutter on purpose as a user prompt. I don't much care for this. If muttering is used, it should be a selectable option.

Another big compatibility problem with earlier programs is that the built-in clock does not use the same access rules as the earlier Apple clock cards. Software modes will definitely be needed for access.

The IIgs built-in clock is separately available as a desk accessory. My particular clock seems to gain 4 to 5 seconds a day. This seems a tad high.

### How Do The Appleworks Screen Macros Work?

Much of Appleworks fancy text screen "filing card" manipulation is done with 17 macro commands. These macros are passed on to the screen routines just as if they were ordinary printing characters.

Since control commands do not appear on the screen anyway, the codes for the first 17 control commands were usurped and replaced with these custom screen macros.

Figure 1 shows us these commands.

Many of these commands are obvious. Clears are available to clear line, rest of line, window, and rest of window.

Macro $05 is particularly interesting, since it converts a window-relative horizontal and vertical position into a screen absolute one. To use this macro command, start with an $05 and then follow it with the inwindow horizontal and vertical cursor positions.

For instance, an $05 $03 $04 will automatically move you four characters in and five lines down, regardless of where the window is on the screen. Note that a zero horizontal value is the leftmost and a zero vertical value is the topmost.

Continuing down the list, there's both a frontspace and backspace, followed by upline and downline commands.

These later two will scroll in the proper direction when they reach the top or bottom of the window.

There are two macros for normal and inverse text. These are followed by four window setting commands. The first ($0C) sets the bottom right of the window. The second ($0D) resets the cursor to the left of window. The third ($0E) sets the upper left of the window, while the fourth ($0F) opens the window back to full screen.

Macro $10 blorks the speaker for an error alert.

Finally, macro $11 does a horizontal scroll with the next byte deciding how far to go in which direction. Positive $00 to $4F values go to the right, while negative $FF to $CF values go to the left.

Much more detail on all this appears in the brand new prerelease of my Appleworks Disassembly Script.

### Show Me Some More Patches For ProDOS AppleWriter

In continuing our ongoing AppleWriter patch series, Figure 2 is a GLOSSIFIER patch for ProDOS AppleWriter 2.1 that eliminates a rarely activated glossary bug that can cause all sorts of prob-

continued on page 226

**This patch is for ProDOS Applewriter 2.1 version AWD.SYS only. AWD.SYS runs only on the 80 column IIc or the 128K IIe.**

**It eliminates the potential ability to overwrite the glossary and destroy the program. Corrects a byte in the original code that is just plain wrong.**

**This patch works by replacing a "glossary full" test byte with the correct value.**

1. **Make a third or higher backup copy of ProDOS Applewriter 2.1, using the filer utilities.**
2. **Get into /BASICS.SYS. Then CALL -151 to get into the monitor.**
3. **BLOAD AWD.SYS, A$2000, E$6020, T$0C, D2**
4. **Verify 2B56- 67**
5. **Change 2B56: 0F**
6. **BSAVE AWD.SYS, A$2000, E$6020, T$0C.**

**Fig. 2 - ProDOS Applewriter 2.1 Glossifier patch.**

**$01 - Clear rest of line**
**$02 - Clear entire line**
**$03 - Clear rest of window**
**$04 - Clear entire window**

**$05 - Relative to absolute cursor**
**$06 - Backspace**
**$07 - Frontspace**
**$08 - Cursor up; scroll down at top**

**$09 - Cursor down; scroll up at bottom**
**$0A - Set inverse text**
**$0B - Set normal text**
**$0C - Set bottom right of window**

**$0D - Move cursor to left of window**
**$0E - Set upper left of window**
**$0F - Open window to full screen**
**$10 - Blork the speaker**

**$11 - Do a horizontal scroll**

**Fig. 1 - Appleworks screen macro commands.**

# MACINTOSH

## MaxThink Idea Processor

by John J. Anderson

Many of us who write for a living have discovered the remarkable power of the word processor. Revision, which is the true process of writing, is made incomparably easier upon a computer screen, as opposed to a legal pad or typewriter. When making changes, additions, deletions, and corrections, writing with a word processor saves time, effort, and pain.

But when you think about the services that a word processor supplies, you may realize that they fall into a category that could be labeled "secretarial." They are at their best working on the mechanics of entry, editing, and appearances. Yes, changes are easy to make. Yes, cleaning up syntax, spelling, and the final look of a document are vastly simplified. Yes, revision is made easy. But what about the things supposed to happen before the keys ever get pressed—the organization of your ideas, structure, content, and relationships?

Shouldn't a computer be able to provide a deeper service to the writer? Why can't computer power be used to help the writer organize his or her thinking, lay out the components of a body of text, and order them effectively? Couldn't a computer help a writer to compose arguments logically, cover all the bases in the exploration of a topic, and put forward clear, concise, and well-thought-out writing?

Ideally, a computer should help a writer not only to polish the final product, but to polish the thought behind the final product as well.

Enter MaxThink, for the IBM PC, Macintosh, and Atari ST computers. MaxThink is labeled as an "idea processor," and it begins where a word processor leaves off, or perhaps more accurately, at a point far before a word processor can become truly effective. If you are at all familiar with an older product called ThinkTank, from Living Videotext, MaxThink will remind you of it strongly. Both products are at their hearts outlining tools.

Unfortunately, due to our early schooling, most of us shudder when we hear that term "outline." It takes us back to junior high, when our teachers forced us to construct mammoth outlines, nesting the thousand components of the War of 1812 into indented cubbyholes, neatly labeled with numbers, letters, and the height of high school chic, Roman numerals. School makes the outline into a daunting prospect, an exacting, precise art, calling for massive revision itself in order to be effective. My own memories of sitting in front of a typewriter, white-out in one hand and my social studies book in the other, are etched into my memory.

The fact is that an outline is simply an organized list, and making lists, whether amied at the local Chinese laundry or superpower arms control, is one of tht most effective ways of giving definition to our thinking. The true power of MaxThink is that it provides a structure through which the creation and revision of outlines is made easy—I would not hesitate to say "intuitive," if that word were not so overused.

For the writer, nothing helps to organize writing projects like the construction of outlines. An outline of objectives can help define goals, strategems, transitions, argument cores, and conclusions. An outline of paths can organize subject matter, order topics, and logically underpin arguments. Even before things are this concrete, MaxThink can help the writer explore and solidify his or her own thoughts, gaining direction in even the most complex of projects.

MaxThink is like a word processor, in that it manipulates text using the conventional user interface of keyboard, screen, and mouse operations. As such, it matches the familiar processes of WordStar, MacWrite, or STWriter, and requires the same skills in order to use. Starting there, MaxThink moves to list processing, as it includes commands to quickly collect, organize, alphabetize, sort, segment, prioritize, and display lists of text. MaxThinks list formats and commands help users examine their information for completeness, parallelism, and sequence. It moves from simple lists to outlines, using commands that organize, develop, and display information in hierarchical formats.

MaxThink painlessly brings to the user four major benefits impossible to achieve with a "mere" word processor. MaxThink displays the "inner" relationships between concepts; it allows information to be expanded or contracted strategically in order to focus on important components; it allows information to be assembled or broken down in different ways, with a minimum of effort in effecting changes; and it simplifies classification, categorization, and grouping operations.

The default MaxThink screen looks much like the default screen of a word processor, and in fact, you may enter text just as if it was. But when the time comes, using the "edit" menu, you can quickly and simply organize your thinking into topics and nested subtopics. Each topic can contain as little or as much text as you desire, from a blank line (to be filled in later) to pages and pages of text.

Once an outline is created, it can be saved, printed, or viewed. When saved, it can be stored as a MaxThink outline, or as an ASCII document which can then be read by a word processing program. When printed out or viewed, MaxThink automatically adds the numbering your teachers were so fussy about: cardinal, ordinal, alphabetic and Roman numerals are flexibly available at the touch of a key.

The operations available upon outlines are varied and powerful. A fast-move option allows you to cut and paste with a minimum of effort. In this mode, the cursor turns into a scalpel until you indicate the cut—then it transforms into a syringe, until you "inject" it where you'd prefer it to be. Blocks of text can also be cut or copied, and a host of specialized paste commands puts topics just where you want them.

Just to the right of the pull-down edit menu is the sort menu, which offers a range of sort operations upon lists. Prioritize allows you to quickly organize a list of topics by priority. When selected, the command clears the screen and displays either range-marked topics or the entire list of topics on the current level. Just above the listed topics is a dividing line with the sentence "Click Here to Rotate List." In this way, you can click through a list, ordering its components without muss or fuss.

The Binsort command converts a list of topics into sub-

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## MacUniverse

by L. J. Kutten

**New Macs are acoming:** Rumors are flying fast and furious about Apple's forthcoming new machines. According to the latest talk, two different machines will make their debut in 1987. The first is a replacement/big brother to the current Macintosh Plus. It will have 4 meg of RAM, a 16MHZ 68020 processor, a graphics co-processor, a 1.6 mb internal 3.5-inch disk floppy drive that works twice as fast as current drives, much higher screen resolution (perhaps twice the current resolution), and one or two expansion ports/slots. Estimated cost for this beauty will be around $4000.

The second machine is a high-end unit developed for universities, CAD/CAM development, and the like. It will have 20 meg of RAM, a 16MHZ 68020 processor, a graphics co-processor, a built in hard disk drive, a larger screen (perhaps 1024x1024 dot resolution, and come in two or more pieces. Estimated cost is under $10,000.

These descriptions are pure rumors. Unlike the past, most people who know for sure will not speak. Apple has made it quite clear that developers who blab will not get preferential treatment in the future.

**Lower prices for Macintosh:** Still more evidence that Apple is planning to release a new Mac in early 1987 is found in Apple's latest price reduction. The Macintosh Plus has dropped from $2599 to $2199; the Macintosh 512K Enhanced went down from $1999 to $1699, and the LaserWriter from $5,999 to $4999.

**The Apple IIGS:** I recently received a large press kit from Apple heralding the release of the Apple IIGS. This is the newest model in the Apple II family. Supposedly it has enhanced graphics and sound that are better than the Macintosh. Normally I throw Apple II material away without reading it. But this time I did not, and I'm glad. There are a number of interesting tidbits with direct relevance to the Macintosh.

First and foremost Apple has finally developed a SCSI version of its 20 meg hard disk. Called the Apple Hard Disk 20SC, its suggested retail price is $1299 ($100 more than the serial version), and comes in two colors, beige or platinum (more about that later). This probably heralds the end of the Macintosh Enhanced. There is no reason for Apple to manufacture two versions of the same hard drive.

Apple has developed an 800K, 3.5 inch floppy that has a disk eject button and an in-use light. This drive has a suggested retail of $399 and comes in platinum. As with the SCSI hard disk, there is no reason for Apple to manufacture two versions of an 800K 3.5 inch drive. Therefore, the current Macintosh 800K drive is not likely to be long for this world.

The IIGS has a ROM that supports a Macintosh-like "Quickdraw" routine which makes possible pull-down menus, windows, and icons. The ROM also supports the AppleTalk network. To me this indicates that Apple is planning a merge of the II and Macintosh environments. (There are already a number of programs that allow the Macintosh to emulate an Apple IIe.)

Finally Apple has a new "official house color" for its products, platinum. The probability is therefore high that the color of any new Macintosh will be platinum.

**LaserSpool:** Two months ago I recommended against buying the MacBuffer LW, a hardware-based LaserWriter spooler. I said what it did with expensive hardware could be done cheaply with software. At that time, I should have men-

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**MacUniverse continued from page 111**

tioned *LaserSpool*. This is a software product that in fact does the same thing, and costs only $100.

*LaserSpool* works with either a Macintosh 512 Enhanced with an 800K disk drive or a Macintosh Plus. It operates by replacing the standard Apple Laserwriter Print Driver and LaserPrep file.

Once *LaserSpool* is invoked, a print command causes a Postscript file to be generated. Once the file is created, the Macintosh is free for other uses while the Postscript file is printed out. This file is temporary and automatically disappears as soon as it is printed out.

*LaserSpool* does save time. On a one-page letter, control of the Macintosh returned after one and a half minutes.

*LaserSpool* needs plenty of space to create the Postscript file. As this file is approximately the same size as the master file, disk storage might be a problem. With short documents (under 10 pages) a floppy will be sufficient. With large documents, a hard disk may be necessary.

As a bonus feature, *LaserSpool* can queue documents. If you have a number of Macintoshes hooked up to an AppleTalk network, a print operation requested by one is accepted even if the printer is busy printing a document sent by another Macintosh on the network. Once the first file is printed, if you need to free up a serial port for other peripherals.

**More on *Mac dBase*:** The odds are that by the time you read this Ashton Tate will have released *Mac dBase*. Now don't get mad if I refuse to stand up and cheer. I have only seen this program run once in a prerelease version, but that was enough to tell me that Ashton Tate is a day late and a dollar short with this product.

The theory behind *Mac dBase* is that all Macintosh business users are lusting to get the power of *dBase II* and *III* into their computer. If you have ever tried to use *dBase II* you know how hard it is. Well do not think *Mac dBase* will be any easier. According to the good folks at Ashton Tate, this program is so easy to learn that it comes with an interactive tutorial, an on-disk help file, and four (!) manuals.

The manuals themselves should drive most people crazy. Just think of all the fun reading you can do wading through (1) Learning *dBase Mac* (the tutorial book), (2) Using *dBase Mac* (the reference guide), (3) Exchanging Files with *dBase Mac* (still another reference guide), and (4) *dBase Mac* Templates.

But the manuals will be nothing compared to understanding the procedural langage. If you ever thought learning a foreign language in school was hard, you have not seen anything until you attempt to write such cute instructions as the following:

```
IF LENGTH ({ZIP*Employees})=5 AND
        askedflag<=>"T" THEN

ALERT ("Please provide 9 digit ZIP,
        if available",CAUTION)

askedflag="T"

SETNEXTFIELD ({ZIP*Employees})

END
```

the second automatically starts. This continues until all queued files are printed.

*LaserSpool* appears to be rather solid programming. I have used it successfully with MacWrite, Microsoft Word, MORE, MacPaint, and MacDraw. According to the documentation it does not work with PageMaker or JustText. The only limitation I discovered is that *LaserSpool* does not work with downloadable laser fonts.

*LaserSpool* has a suggested retail price of $100 and is not copy protected. In an AppleTalk environment, you are allowed to install it on each unit. If you do a lot of Laserwriter printing, this program may be the best $100 you've ever spent.

DEC VT240 emulation on a Mac: I recently came across a program called *MAC240* that lets a Macintosh emulate a DEC VT240 general purpose and graphics terminal. It offers full ReGIS graphics, all ANSI standard escape sequences, DEC VT100/VT200 emulation, and printer support.

*MAC240* works on all Macintoshes and is not copy protected. It costs $199.

**Upgrade to a MacBottom SCSI:** Personal Computer Peripheral Corporation is giving users of its 20-meg serial port MacBottom hard disk a dirt cheap way to upgrade to a SCSI (pronounced "sexy" or "scuzzy") hard disk drive. For only $200, PCPC will convert their old units to the SCSI standard. This is especially useful

Of course my doomsaying not withstanding, Ashton Tate will probably sell thousands of units and laugh all the way to the bank.

If you must get *Mac dBase* be prepared to shell out $495. The program requires 512K of memory and two disk drives, one of which must be 800K. *Mac dBase* is not copy protected.

**Fans for the Mac:** I must have struck a sore point with a lot of people when I told the story in the July issue about how the power supply board in my Macintosh died. I have gotten a lot of mail from people telling similar stories. According to George Engle, president of the Rome, NY Mac User Group, almost a third of his members have had power supply problems. I have heard similar ratios from other groups.

The reason for this high rate of failure is simple: the chips and board get fried by the heat. (Supposedly the internal temperature of a Mac is around 125 degrees fahrenheit). Why does the Mac get so hot? The reason is simple. Steven Jobs had a thing against fans (supposedly they were too noisy), so they were left out.

So to save your Macintosh, I urge all of you to get a fan to cool things down. My favorite is the Kensington Microware System Saver Fan, but any fan is better than no fan.

**More thoughts about *Hard Disk Util*:** At a recent computer show I was taken to task by FWB Software, creators of *Hard Disk Util*, for my comments regarding their product that appeared in the September issue. At that time, I said that Central Point Software's program, *Copy II Mac*, was a better buy, as its suggested price was $50 less. According to the folks at FWB, their software is actually the better buy since upgrades are free.

They are correct, to a point. Their upgrades are free, provided you subscribe to their bulletin board. The subscription costs money as well as long distance charges. If you can't telecommunicate then you have to buy additional diskettes that cost approximately $25 each. Conversely the mail order price for the newest version of *Copy II Mac* is around $20.

More to the point, I just prefer the general utility of *Copy II Mac*. Don't get me wrong, *Hard Disk Util* is a great program. But on hard-to-copy programs, it acts as a "magic bullet." Either the correct patch exists or it does not exist. If it does, you can copy the program, if it doesn't, then you cannot copy. In contrast, *Copy II Mac* is a broad-based program. While it cannot copy everything, it can copy most. That in itself makes it more useful.

**X-rays and magnetic media:** As long as I have been involved with microcomputers, there have been horror stories about airport x-ray machines—how they and their like have destroyed magnetic media. I am glad to say that they are just horror stories, and no more than that.

The final word on this subject is contained in a U.S. Department of Commerce Report, *Care and Handling of Magnetic Storage Media*. According to the National Bureau of Standards, to affect a diskette the X-ray machine must generate a *lethal* amount of radiation. Similarly a strong magnet has to get within three inches of the diskette before the media is affected.

If you use your Macintosh in business or otherwise have important data that must be stored, this report will lead you in the right direction. It is available for purchase from the Government Printing Office for $5.50. It is also available at

**continued on page 245**

**MaxThink continued from page 111**

topics of several user-defined categories. The metaphor is "tossing each topic into the appropriate bin" in order to quickly convert a long list of disorganized topics into several smaller groups or categories. Binsort is like finding the implicit structure, or building an outline from the bottom up. According to the documentation accompanying MaxThink, "Writers and creative thinkers often say Binsort is their favorite command. They first enter hundreds of pieces of unorganized information, then use Binsort to find, organize, and develop hierarchical relationships."

Other available sorts are Levelize, which allows you to move a specified number of levels of subtopics up to the same level as their parent topic; Randomize, which lets you mix up the order of a range of topics, producing new, possibly helpful patterns of thought; and Alphabetize.

MaxThink also offers a Search command, to automatically lead you to the desired topic, subtopic, or text. Toggle Expand lets you choose whether or not to display all of the subtopics below one or more topics in your outline. As your outline grows, this command helps keep things manageable by shutting down the details in areas you are not currently interested in expanding upon. The Reclaim command retrieves a previously-deleted topic or block of text. The Help On/Off command provides help on any of the commands in MaxThink's pulldown menus. The Join command combines several topics together into one large topic of text. Any subtopics of the topics being joined will become subtopics of the first topic in the range being joined. The Divide command does just the opposite. It converts a topic with multiple lines of text into multiple topics, each containing one line of text.

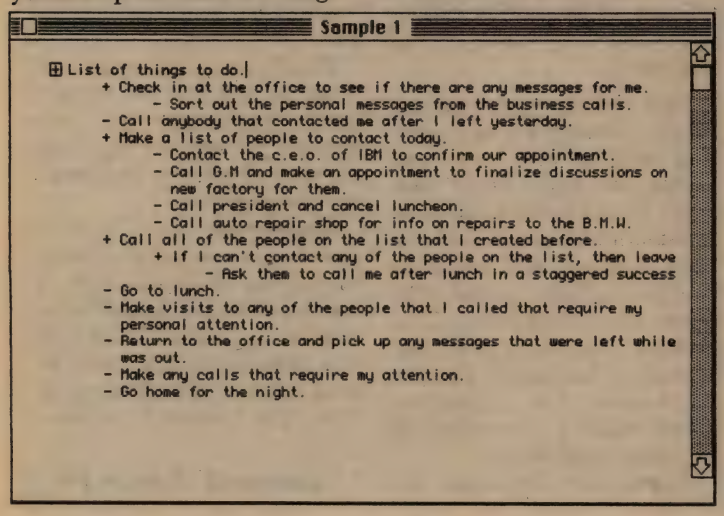
In addition, MaxThink offers eight "markers," which create a look-up table for quickly moving to designated topics in your outline.

The documentation of MaxThink is quite well-done, and it's a good thing—when your product advertises improved writing skills. In fact, a writer's guide that constitutes the second half of the documentation not only summarizes how to get the most out of MaxThink, but offers very sound general advice as well. It offers its services to "writers, thinkers, planners, scholars, managers, designers, executives, consultants and other intellectual entrepreneurs."

MaxThink is capable of building a 100 level outline, including over 4,000 topics. It supports multiple windows, allowing two outlines to be open simultaneously, as well as cut and paste between multiple windows.

While I would not use MaxThink for every writing project, it is a well-built tool, and I appreciate having it around. When my next big project comes around, I'm sure it will get booted. It is more powerful and more practical than ThinkTank, and a far sight easier to plan with than a pencil, typewriter, or word processor.

Price: $89.00; MaxThink, 230 Crocker Avenue, Piedmont, CA 94610; (415) 428-0104. ●



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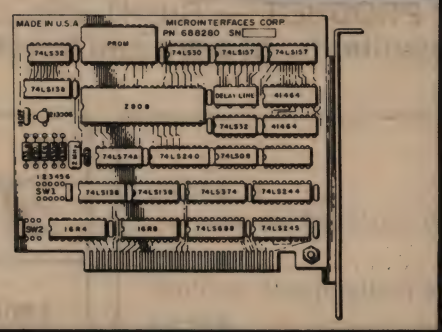


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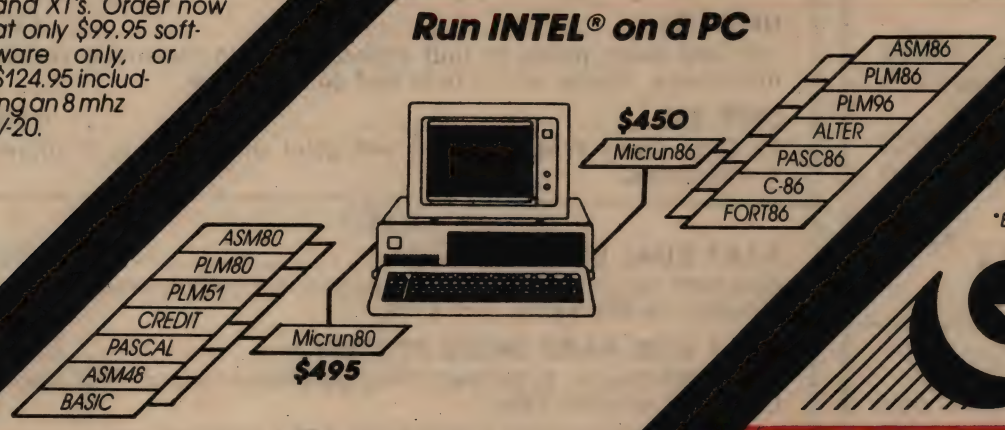


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# ATARI

# Applying The Atari

by Jeff Brenner

And yet another year draws to a close. This month we'll take a look at new products, reader mail, and we'll learn about Atari's public offering. As a holdiay treat, your fingers get a rest from typing this month, unless, of course, you are still entering last month's Forms Generator! The ENTER DATA AND CALCULATE feature will be listed here next month. This month's diskette will contain public domain holiday programs and games.

### Atari News

At this writing, Atari Corp. announced that it will be offering 4.5 million shares of Common Stock at between $11.50 and $13.50 per share. Such an offering would have been inconceivable only a couple of years ago, when Atari was on the brink of financial disaster. The "going public" news had been anticipated over the past several months, due to the healthy sales and outlook of the new Atari. (Thank you, Mr. Tramiel.) Atari users' groups greeted the news enthusiastically, and a number of newsletters I received following the announcement offered their members free financial advice (i.e. "sell everything and buy Atari shares").

### New Products

Duplicating Technologies (DT) has announced that revision 3.0 of its 1050 duplicator software is now being shipped. DT claims that the 3.0 will backup all programs with the "light skew" form of protection, such as programs by SSI and MicroProse; "weak sector" programs, such as Goonies and Never Ending Story; and "Funny Track 39" programs, including Hard Ball and Apshai Triology. Revision 3.0 has two disks instead of one. Unfortunately, most 1050 Duplicator owners will need DT's new 5.0 chip, since the new software will not work with the older chip (despite DT's claim that all future updates would be software-based). To get revision 3.0 and the 5.0 chip, you must return your original 1050 Duplicator software and your old chip to Duplicating Technologies, 99 Jericho Tpke, Suite 302A, Jericho, NY 11735. Alternatively, you can send $10 to DT for the updates if you do not want to return the original disk and chip.

Baudville has released an Atari version of Blazing Paddles, a graphics program modeled after MacPaint. The program accepts input from a variety of sources: joystick, paddles, touch tablet or light pen. In addition to the standard line, circle and box drawing features, Blazing Paddles supports the overlaying of text or shapes, a zoom mode, mixing colors, a spray-paint mode, and a cut-and-paste mode. A built-in graphics dump prints your artistic creations on the Okimate 20, Okidata, Epson Gemini or Panasonic. A formal review in *Computer Shopper* is forthcoming. Suggested retail price is $34.95. Contact: Baudville, 1001 Medical Park Drive, S.E., Grand Rapids, MI 49506.

In the August 1986 column, reader Patrick Presley had inquired about a hard disk interface for the Atari. At the time I suggested a 10MB hard disk from Supra Corp. Now, ICD's Multi I/O Board should be available. The Multi I/O, or MIO, is available in 256K ($199) or 1M (megabyte) ($349) versions and offers not only a hard disk interface, but a parallel printer interface, modem or serial printer interface and a built-in printer spooler. ICD says any standard hard disk can be used with a SASI or SCSI controller. Contact: ICD, 1220 Rock Street, Suite 310, Rockford, IL 61101-1437.

### Reader Mail

Dear Jeff:

This is in response to a letter from Art and Debi Conrad that I just noticed in your column. They are having difficulty with their Atari 1027 printer.

I had a similar problem with my printer. It began printing garble a couple of months after its purchase. Generally it would begin printing correctly, but after a few lines it would start printing garble. At times it would print garble from the beginning. This led to much frustration.

The solution turned out to be very simple, however. The lubricant applied at the factory to the bar that the print wheel slides on, was of a thicker viscocity than what it should have been. I merely cleaned this bar carefully with an absorbent cloth. I then sprayed some silicon lubricant into the rag and wiped it onto the bar. My printer has functioned flawlessly since that time. I spent hours troubleshooting before I discovered what was wrong.

I've discovered another thing that might be of use to other 1027 owners. It's difficult to find replacement ink rollers; they must be mail ordered. It took several weeks for the last bunch I ordered to arrive. I have found that if one heats the ink roller and print wheel with a blow dryer just before printing, the print will be applied darker. This is especially true after one has been applying stamp pad ink to the ink roller.

*Steve Miller*
*Tacoma, Washington*

Many thanks, Steve. I hope Art and Debi and other 1027 owners benefit from your advice.

Dear Jeff:

I currently reside in Frankfurt, West Germany, and am experiencing some problems with my Atari 1050 disk drive. Since my computer and peripherals were bought in the U.S. I would assume that they are designed to operate on 60 hertz. However, here in Germany the line frequency is 50 hertz. So far this has not proven to be a problem as I have been running an 800XL, a 130XE, an Indus drive, two 1050 drives, and a Smith Corona D200 printer with no problems. All commercial software boots and behaves normally as well as any that I have written. Recently I purchased Duplicating Technologies 1050 Duplicator and have been having some difficulty in backing up the majority of my software. It may be that once I receive the revision 3 software from the company that my problems will be resolved.

Be that as it may, the current problem has to do with information received from Duplitec as to a possible cause of difficulty. It seems that they are suggesting that I run my drives at 345RPM vice 288-RPM to make up for the difference in line frequency. At first this would appear to make sense, as the European line frequency is 20% lower than the U.S. standard of 60 hertz. This being the case, 20% of 288 would be 57.6RPM, added to 288RPM would give the recommended figure of 345-RPM. Unfortunately, when I set my drive to 345 it refuses to read any disks at all. I then have to play with my drive speed until I can get a disk to boot, at which time I can adjust my speed back to 288.

I hope you can give me some assistance in this matter.

*Orrie B. Bayliss, III*
*Frankfurt, West Germany*

I often receive letters from readers stationed overseas who attribute a particular problem to the 50Hz line frequency. A majority of these problems are not related to the line frequency at all, and I suspect the same is true in your case. Since you are having no problems with your unmodified 1050 disk drives, I see no reason why the 1050 Duplicator would cause line frequency problems. The 1050 motor itself is direct current driven. Furthermore, if your RPM software is telling you your drive is running at 288RPM, it is running at 288RPM. I do not know why Duplicating Technologies suggested that you try slowing the drive down.

Revision 3 of the Duplicator is now available (see above news) but this will only help you backup additional software—not run it. The more likely cause of your problem is a form of copy protection on commercial software. Many commercial programs will detect the faster speed with which the 1050 Duplicator drive loads programs and will hang up. The solution is to deprogram your drive to make it appear as an unmodified drive to the software you are loading. This applies to all users of modified drives, in the United States as well as overseas. With the 1050 Duplicator, this is done by loading the RPMTEST program on the Duplicator diskette and selecting the deprogram option. Good luck.

Dear Jeff:

I enjoy your column in the *Computer Shopper* very much. I am responding to a comment that you made in a past issue about "orphan" hardware. A few years back, I bought a Micro Mainframe disk drive and the company has subsequently discontinued the production of Atari compatible equipment (they are still a TRS-80 third party manufacturer).

Their disk drive is a very powerful peripheral and I would like to share experiences with other MMF owners—particularly anyone who has added memory to the printer buffer or programmed the drive beyond the examples in the manual.

I added a second SSDD drive—it was remarkably easy—perhaps there is someone who has added a DSDD drive—or is running an eight inch drive? All this was possible with this drive, and I would like to hear from these others. Or, if someone was interested in expanding to another SSDD drive, I could help.

*Eric Andersen*
*20 Meadow Garden Lane*
*Dover, DE 19901-6524*

I've printed your address so others can correspond.

The Digitized Rhythm Demo Software Listing was omitted from the October 1986 issue. If you are interested in obtaining a copy of this listing, mail a SASE to *Computer Shopper* c/o Annda Kinsey and request it.

### Next Month

We'll finish entering Forms Generator and a sample invoice form, and we'll also have more reader mail and product news. I wish all of my readers a very joyous holiday season.

*Readers questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply. Due to volume of letters received, only a selected number of personal responses can be given each month.*

The holiday program diskette is available from the author for $7 postpaid. Please make checks payable to "Jeff Brenner" and specify your disk drive model.

Program Perfect is a utility used to check for typing errors while entering programs for this column. Readers can send $5 for a diskette or a SASE for a listing of this program.

Address all correspondence to: Jeff Brenner
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Same as modem above but features built-in error checking with MNP (MicroCom Networking Protocol). **REDUCED: CALL**

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# ATARI ST

## Hacking The ST

by Wynn Rostek

I have had a few letters asking if it is legal to put the programs from this column on a BBS for others to download. The short programs I write for this column are intended to help ST owners understand the inner workings of the ST, so by all means, pass them along giving credit to *Computer Shopper*. The more people know about their STs, the more use they will get out of them, and that is the whole point of this series.

Because there is more to computing than just a programming language or two, I will often discuss subjects that are not solely related to the ST. This is in line with helping you get the most out of your computer. Much of the material you will see here can be applied to any computer, but I will assume that you have an ST. The bottom line is that I'm trying to help you learn about computers, and I just happen to use the Atari ST computers as examples.

Because there is so much interest in the ST series, I am going through the bios and xbios calls so that you can get to the low level routines used to accomplish "real world" tasks. This is not to say that hardware is slighted, as an example the 68901 MFP chip was covered in detail. I have also shown how to wire a relay to the ST and how to control the relay. I now have another hardware project in the works and one completed, so this column will not be composed of just software.

I will discuss topics that I think are important to an understanding of computers, but this is really your column so if you need information about something let me know. I'm more than happy to cover the topics you request. (Besides it keeps me from having to come up with a topic, which is one less decision I have to make.)

I seem to be getting a mountain of mail on interfacing BASIC to machine language so I will step up the work on that article. Most of the BASIC/machine language questions are from readers who are trying to access the lower level functions like bios and xbios routines, so I will have drivers for these functions for you shortly.

I received a package the other day from Alan Glick. He requested that I mention their user group and newsletter, so here goes. I hope that quite a few of you have heard of the Boston Computer Society, they are one of the largest computer groups in the world. They have an active ST group which publishes *The Jackintosh Boston Users Group Newsletter* also known as *J-BUG*.

Alan included an issue of the newsletter and I was impressed with what I saw. In addition to the normal club information like minutes of the meeting and officers list and reviews of software, *J-BUG* also had feature articles, commentaries and several special interest group columns.

I was very impressed with a complete archive utility that was written to replace the non-functioning version supplied by Atari. A 14-page program is an impressive feat for any user group, but this is a very useful tool to boot. With the large membership to draw on, and the general level of computer expertise available in the Boston area, I expect great things from *J-BUG*.

If you have any questions about *J-BUG* or the Boston Computer Society, try writing to Alan at:

Alan Glick
30 Francis Drive
Randolph, MA 02368

James Hardin wrote to ask about getting the time and date from the system. This prompts me to explain that the ST maintains two times and two dates. The intelligent keyboard maintains the time and date and GEMDOS maintains its own time and date.

The intelligent keyboard has its own CPU which keeps track of internally generated time ticks. The ticks generate interrupts and the CPU inside the keyboard keeps track of the number of ticks that have occurred. By counting the number of ticks that have occurred, the CPU knows how much time has passed. You can access the system time and date through the Settime( ) and Gettime( ) xbios calls.

The system time and date is returned in a long value by the

continued on page 118

LISTING 1 — Extracting time and date from system time.

```
VOID time(t,s)

long t;
int s[6];

/* this function is passed the time of year in a */
/* long, and an array of integers.  It extracts  */
/* the time of year from the long and places the */
/* results in the integer array                  */
/* our array is filled as follows:               */
/*    year,month,day,hours,minutes,seconds       */
/*     [0]  [1]  [2]  [3]   [4]      [5]         */
{
long raw;
long mask;
int temp;

raw = t;
mask = 0x1f;
temp = (int) (raw & mask);
s[5] = 2 * temp;

raw = t >> 5;
mask = 0x3f;
temp = (int) (raw & mask);
s[4] = temp;

raw = t >> 11;
mask = 0x1f;
temp = (int) (raw & mask);
s[3] = temp;

raw = t >> 16;
mask = 0x1f;
temp = (int) (raw & mask);
s[2] = temp;

raw = t >> 21;
mask = 0xf;
temp = (int) (raw & mask);
s[1] = temp;

raw = t >> 25;
mask = 0x7f;
temp = (int) (raw & mask);
temp += 80;
s[0] = temp;
}
```

## Home Accountant For The Atari ST

by H. Clark Robbins

A lot of people ask me what kind of computer to buy. That question is always answered by a question: what do you want to do with it? A lot of people don't know what they want to do with a computer, and they guess they want to put their budget on it.

Home Accountant is just what budgeters are looking for, and then some. You can keep complete records of your checking account activities including deposits, checks and non-check charges to your checking account. Not only are your records complete, there is a Search feature to allow you to locate an entry instantly. At the end of the month, it will even reconcile your statement for you. You can use these same features for your credit card accounts, and Home Accountant will even prepare reports for you that can be printed or displayed.

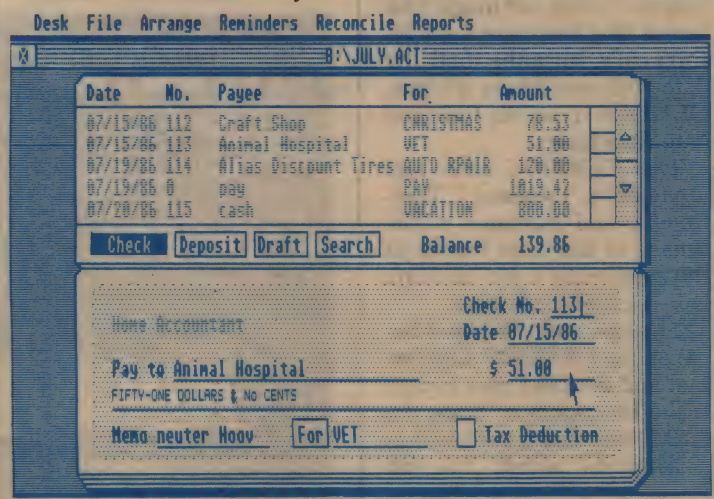


FIGURE 1

When invoked, Home Accountant will prompt the user for the date, using a standard dialog box. Once entered, the image of a checkbook will be displayed. This is the workplace of most of the work you will do with Home Accountant. See Figure 1.

Now you will want to load any previous checking account information you may have saved if you have done any work with this account before. Loading and saving files is done with the standard GEM file selector. The file selector displays the directory of the files on your disk with the .ACT file type. Loading a file causes the current balance and the associated check register to be displayed.

The manual starts the user off with simple checkbook entries. To make an entry into the register, you simply fill out the image of the check. The fields are just what you might expect: Check Number, Date, Payee, Amount, Memo, For, and a Tax Deduction flag.

Home Accountant make this an easy task. The cursor, a thin vertical line, begins in the Check Number field. You can enter the check number of your choice, between one and five digits. You can use the backspace key to make corrections to the field, if needed. Home Accountant will prevent you from entering any non-numeric characters in this field by screening your input and ignoring non-numeric characters.

At any time you can reposition the cursor on another check field by just pointing the mouse at it and clicking. Simpler, though, you can

continued on page 251

LISTING 2 — Time and date from IKB and GEMDOS.

```
#include (stdio.h)
#include (osbind.h)


/* this program demonstrates the time and date calls */
/* that are available on the ST                      */


main()

{
long timedate;
int td[6];
long temp;
int t1;
long t2;
long old;

printf("The system time and date:\n");
timedate = Gettime();
old = timedate;
time(timedate,td);
shotime(td);

printf("\nThe GEMDOS time and date:\n"):
t1 = Tgetdate();
temp = (long) t1;
temp = temp << 16;
temp &= 0xffff0000L;
t1 = Tgettime();
t2 = (long) t1;
t2 &= 0x0000ffffL;
temp += t2;
time(temp,td);
shotime(td);

printf("Hit any key to continue ");
Bconin(2);
}



VOID time(t,s)

long t;
int s[6];

/* this function is passed the time of year in a */
/* long, and an array of integers.  It extracts  */
/* the time of year from the long and places the */
/* results in the integer array                  */
/* our array is filled as follows:               */
/*    year,month,day,hours,minutes,seconds       */
/*     [0]  [1]  [2]  [3]   [4]      [5]         */
{
long raw;
long mask;
int temp;

raw = t;
mask = 0x1f;
temp = (int) (raw & mask);
s[5] = 2 * temp;

raw = t >> 5;
mask = 0x3f;
temp = (int) (raw & mask);
s[4] = temp;

raw = t >> 11;
mask = 0x1f;
temp = (int) (raw & mask);
s[3] = temp;

raw = t >> 16;
mask = 0x1f;
temp = (int) (raw & mask);
s[2] = temp;

raw = t >> 21;
mask = 0xf;
temp = (int) (raw & mask);
s[1] = temp;

raw = t >> 25;
mask = 0x7f;
temp = (int) (raw & mask);
temp += 80;
s[0] = temp;
}



VOID shotime(s)

int s[6];

/* this function displays the time and date that  */
/* was placed into the array by the time function */
{
printf("The date is: %02d/%02d/%02d\n",s[1],s[2],s[0]);
printf("The time is: %02d:%02d:%02d\n",s[3],s[4],s[5]);
}
```

**Hacking The ST continued from page 117**

Gettime( ) call. All of the information is packed into the long word, so you have to do a little work to extract it.

Computer scientists tend to start numbering at 0, so if we call the least significant bit 0, the most significant bit is bit 31. Using this bit numbering scheme, the informaton is packed as follows:

The time is stored in bits 0 through 15. Bits 0 through 4 are the seconds. A little quick checking will tell you that 5 bits can only count from 0 to 31. Since there are 60 seconds in a minute, and we can only count to 31, we need some way of packing more information into the 5 second bits.

The way the ST handles the problem is that it doesn't count individual seconds. The seconds are only incremented every other second, so the value in bits 0 through 4 is the number of "two seconds" that have passed. Bits 5 through 10 are the minutes and bits 11 through 15 are the hours.

In order to extract the time from the long value, you will need to do some shifting and masking. A routine will be presented later to extract the data from the long value for you.

The date is stored in bits 16 through 31. Bits 16 through 20 are the day of the month, bits 21 through 24 contain the month, and bits 25 through 31 contain the year. Since we cannot cram the complete year (1986) into 7 bits, the system uses an offset of 1980. This means to get the actual year, you add the value in bits 25 through 31 to 1980.

Listing 1 is a routine that will extract the information from a long word returned by the Gettime( ) call and place it into an array of six integers.

In addition to the xbios calls to get and set the time and date, there are GEMDOS calls that can be used to get and set them. The main difference between the GEMDOS calls and the xbios calls is the GEMDOS calls use words, not longs. This means that there are 4 GEMDOS calls, since the time and date will not fit in 16 bits, GEMDOS treats the time and date separately.

The GEMDOS calls are: Tgetdate( ), Tsetdate( ), Tgettime( ), and Tsettime( ). The time is in the same format as the xbios calls( ), but the date is in a different format.

The only real difference between the GEMDOS date format and the xbios date format is the bit numbers. Since the GEMDOS date is returned as a separate word, the bit

**continued on page 254**

# Contract Bridges Programs For The Atari ST

by H. Clark Robbins

Compubridge is a Complete Bridge Tutorial by Roger Harnish. The bridge tutorial is compiled from Shirley Silverman's Five Card Major Bridge Teachers' Manual.

There is no printed manual for this program. There is just a single sheet that explains about loading the program and program operation. I was pleased to read "Load COMPUBRIDGE by pointing to the FILE menu and selecting "Load." Click on "START.BAS" and the program will load. An alternative...method is to simply type RUN START and press the return key." This impresses me. I know Artworx feels an obligation to people who like pull-down menus and dialog boxes and running the mouse all over the room. Artworx has proven they also have an obligation to people who just like to "Get on with it." We are pleased to just type RUN START to invoke the program.

Since the text and quizzes are slow to load, you may want to run CompuBridge from a hard disk drive or RAM disk. The software is chained together for you in BASIC, but you can't simply type RUN C:START because Compubridge doesn't parse this command for a drive specifier. It has to be run from the same drive you invoked BASIC on. You may need to copy your BASIC program over to the hard disk or RAM disk along with Compubridge.

When invoked, Compubridge comes up with a selection between text and quizzes. This is done with a graphics display page that does not change as the program progresses. Since it does not need to be updated through the course of the play, the program never waits on graphics. The only time you wait is when new text or quizzes are selected, and the files are loaded by the system.

When you select text, you are provided a list of the available lessons. They are:

0 The Absolute beginner
1 Beginning bidding
2 Scoring
3 Point Count
4 Opening Bids
5 Responses to opening bids
6 Forcing bids
7 Overcalls
8 Opening Leads
9 Finesses

Once selected, you can move forward and backward through the lesson until you feel comfortable with the new material. This is mouse-controlled and easy to use.

The text is provided in uppercase characters. Ordinarily, I find it difficult to read a lot of material in uppercase characters, but Compubridge has the information spread out on the display so it is not much of a problem. There is only a small amount of graphics used, for lines in the Scorekeeping lesson.

To make sure you know the basics, you will probably want to start with the first lesson, for the real beginner. There is an explanation of the suits and the ranking of the cards within each suit. There is even an explanation of the deal (passing out cards singly in a clockwise fashion, starting with your left-hand opponent, until all the cards are passed out.) I was very pleased to see that Harnish includes a discussion of the customs associated with bridge, such as who shuffles, who deals, who cuts. This kind of attention to detail will make it easier for the first time a beginner sits down to play with real human beings. He even explains what "cut the cards" means!

As you probably guessed, the lessons become successively harder as they progress. Each

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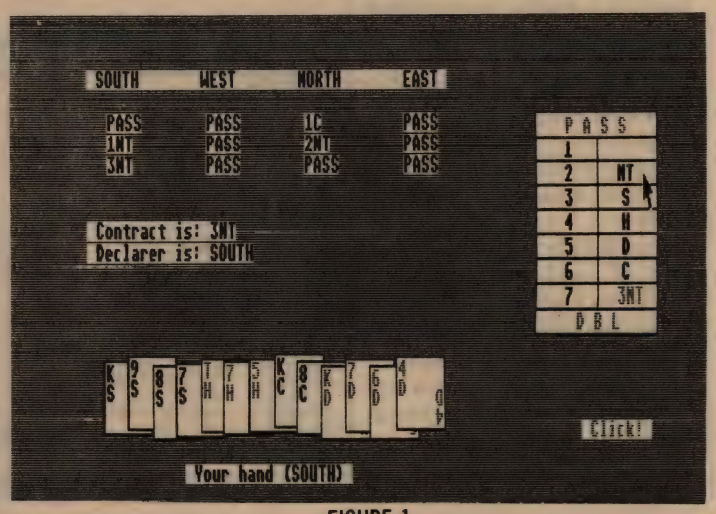


FIGURE 1

# SANYO

## The Silver Box

by Richard Fujita

**Turbo Lightning**

I just got another program from Borland (the land of Boors?). This is one of the many resident spelling programs now being marketed by several companies. The storekeeper did not know if this program worked in the Sanyo or not. A line on the cover says that the program requires IBM PC or true compatibles. Therefore, I felt sure this one would not run in the Sanyo unless some work was done to patch it. I was wrong. The only requirement for the Sanyo is lots of RAM and the video board.

This is a resident spell checker with 83,000 word, spelling dictionary from Random House matched with a *Thesaurus* of unspecified size. The latter should contain about 40,000 indexed words based on my estimate from the size of the index table.

The concept of the true compatibles became muddy since I purchased this program, because it worked just fine as it came out of the package, with just command key changes and a timing delay change. Both are part of normal installation procedures. Installation went smoothly with no help from DEBUG. You have to change some control set-ups but that is about all you have to do. Changing one or two control key combinations can be considered routine.

I followed the instructions with some difficulty, but I did nothing out of ordinary to get the program to work perfectly. However, there are several points which are not fully explained in the instruction book that you must know for a successful operation of this program. The difficulty arises from the omission of the apparent. That is, if you are looking at the particular screen the book is discussing, the explanation is apparent and obvious. If you are just reading the book to gain some insights into the procedure, the omission prevents you from understanding the discussion.

In several places the book recommends you to type "M" key if you have difficulty in the Auto-Proof mode. The book fails to mention that use of "M" key in this context is valid only when you open up the Environment Menu while you are on the Main Menu. In this particular screen, the "M" key selects "Modem Communications" mode, the mode "M." When this particular mode is selected, the proofreading is done directly from the keyboard.

When you open the package, a heat-shrink bag, you get three diskettes. One contains the main program and a set of main spelling/*Thesaurus* dictionaries and several auxiliary dictionaries. The second one contains installation programs, about a dozen environment files and two short RAM resident dictionaries. The third one contains a set of the largest main dictionaries for use with a hard disk.

The program works in the following manner. Whatever you type and appears on the screen is constantly monitored by this program when it is in the Auto-Proof mode. It beeps you when it finds suspicious spelling, as soon as you type a space, or a punctuation after the word. You then use one of six function keys, or open up the main menu and then you decide what to do.

The difference between this program and Spellstar is that you are not (and cannot) batch test it. You have to get word-by-word, or page-by-page. In Auto-Proof mode, you are supposed to correct the word when it beeps you. You can type ahead several more words if you are not at the end of the line and if you did not get the second beep. If you push the "Last bad word" key, the cursor runs back to the bad word and corrects it. This is good, but, when you are putting down what you have in your mind, sometimes this beeping distracts you. As for me, I disconnected the speaker a long time ago and it is not even inside the cabinet any more. So I turned the Auto-Proof off.

**The Incredible Dictionaries**

The checking speed is incredulously fast for the size of the dictionary you have. Normally I use a word checker called *Word Plus*. It takes from about four seconds to a minute or two depending on the alphabets in the word and word length. It starts checking from "A." "AAAA" can be checked much faster than "ZZZZ." Each letter is checked against all the words in the spelling dictionary, so, the longer the word the longer the time it takes to check. That is not so in the "Lightning" (Another bad trade name from Borland because the name represents only a part of the important assets of this program and does not explain the real function of the program.)

I did not check how Lightning treats its dictionaries internally other than reading the explanation given in the instruction book, but the checking speed is at least 500 times faster using a RAM disk which

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## The Sanyo 555 XT Turbocharge Your Sanyo

by Michael Russell

When I decided to upgrade a Sanyo 555 with hard disk, and multiple disk drives, I was in a quandary. We did not want to give up any existing disk drives. We also didn't want the table covered with additional cases and power supplies for external devices. In addition, the Sanyo's case is claustrophobic—it clearly wasn't designed for expansion, and heat dissipation inside is poor. With the hard disk controller card came the suggestion to drill holes in the case to avoid overheating.

I had been unhappy with the wimpy power supply on the Sanyo 550 for some time. Conversations with technicians confirmed that the power supply was so marginal that the addition of even a small accessory such as the 8087 math chip (which draws ½ amp) could overload the 550 enough to give problems in booting. Various power supply "fixes" really don't make up for the fact that the Sanyo has a small power supply, complete with a small transformer, diodes and capacitors. Therefore, if possible I wanted to boost the power to the Sanyo at the same time I arranged for adequate power for a hard disk controller.

The problem, then, was to get all of the disk drives I wanted, hard and floppy, into one case with the 555, making sure it had adequate power for the task. Further, seeing that all of this stuff crammed together wouldn't overheat and cause a board or drive to fail. The solution came with the idea of building a "Sanyo 555 XT."

The country is being flooded with parts and components for the hobbyist to build IBM "clones." These parts include very inexpensive flip top cases and switching power supplies rated at 130 to 150 watts. These cases are large enough to mount up to four half height devices comfortably: Three floppy drives and a hard disk, two hard disks and two floppies, or so on. The XT power supplies are more than adequate for the task. Pricing hard disk power supplies and cabinets, I discovered that they typically cost over $100. Pricing Taiwan XT cases and power supplies, I discovered I could buy one of these for the same price as a drive case would cost. The advantages of the XT were obvious: A big case, easy to open, with great ventilation, room for all the drives, and an attractive appearance (there was an element of amusement at making my Sanyo into a dead ringer for the IBM as well) decided me on the XT route. One additional thought in my mind was that this would make for a smoother transition if I ever decided to go all the way to a complete clone. The conversion was causing no damage to the existing Sanyo case or parts, so it would be simple to put it back together if I would decide to sell it.

The case and power supply arrived quickly and in good condition, and installation was quite simple. I first opened up the Sanyo, removed the drives and mounted them in the XT case. I stacked them top to bottom in the left drive compartment, It had to be the left side, due to the short length of the Sanyo floppy disk controller cable. Surprisingly, the TEAC drives in my Sanyo actually had the hardware on them for stacking purposes. One had a little "L" bracket with a rubber pad mounted on it, which kept the spacing perfectly when it was used as the bottom drive in the stack. A bracket for this purpose also came with the case. I then mounted the hard disk next to the floppies, and the mother board under the floppy drives in the space provided for the IBM motherboard. Of course, the alignment holes for the motherboard do not match that of the Sanyo, but this was no real problem. In this case, we chose simply to lay two strips of plexiglas between the case and the motherboard to keep it from resting on the metal case bottom. If a more elaborate mounting is desired, it would be simple to mark the proper places on the case and drill some small holes to allow use of the mounting hardware provided with the case.

The only tricky part was the power connector. The IBM power supply would not plug directly into the Sanyo. Fortunately, Sanyo had plainly written by each pin on the motherboard its voltage requirement (Ground, +5, -5, +12v), as did the new power supply. It was easy to clip the Sanyo connector from the old box and splice it to the IBM supply. Just to make certain, I checked each line with a voltmeter before plugging in! There were no problems. The Sanyo booted first time, and has run flawlessly ever since.

The result was a very nice looking unit that really caused a stir at the local computer users group meeting when it started running the Sanyo 550 series demo! The old "silver box" was a bit quieter (the 150 watt supply I purchased sounds like it swallowed a vacuum cleaner), but things are running quite a bit cooler. The new case is also quite a bit taller to provide room for the extra drives, but in my case this helped bring the monitor up to eye level. If you are considering adding a hard disk to your Sanyo 555, this might be the way to go. It is easy, inexpensive, and gives the Sanyo the two things its design lacks: Power and space. ●

**The Silver Box continued from page 119**

holds the main dictionary set, compared to other spell checkers I have. Most words are checked in a split second. Generation of the similar word table in a window takes about 1/10 second for each word on my 7.3 MHZ V20 Silver Box.

The Lightning uses three or four dictionaries at all times. It normally uses a RAM resident, small spell-checking dictionary called RAM.DIC. You can choose from three sizes depending on the amount of RAM you can dedicate for it. The size of the RAM.DIC can be as small as 16K, and the largest one is 38K. However, if you have a large RAM disk, say 400K which is used in my Silver Box, you can use one of two large spell-checking dictionaries for this purpose. This setup reduces the wrong suggestions and saves considerable time.

The method of invoking the actions from this resident program is use of control keys, called "Hot Keys." You can call up actions without going through the main menu. Here, comes the real grace for the Sanyo users. The user-friendly quality of this software is that you can select the Hot Keys to suit your needs. This is a great convenience for the Sanyo users! You can select most any combination of keys not being used by Wordstar to act as Hot Keys using the installation program. You may wish you had this freedom of choice in Sidekick. This is why Lightning is a good program for the Sanyo users.

### Fitting It To Sanyo

The first step to use this program starts with a planning of memory allocation. The larger the RAM disk you can use, the faster the operation. The set of the smaller main dictionaries have combined size of 264K bytes. Preferably, you should have the full set of the main dictionary and your word processor application programs in your RAM disk for the sake of the sheer speed. If you do not have a RAM disk exceeding 500K in size, I recommend to keep the full set of the larger dictionaries in your RAM disk. If at all possible, you should use the larger of the spelling dictionary to reduce the number of suspected words. If you do not have a big RAM disk, you can keep the spelling dictionary only and use the *Thesaurus* stored in the floppy disk.

One way to further reduce the size requirement on the RAM disk is to store Wordstar overlays only in the RAM disk since no portion of WS.COM is reloaded after the initial loading is done. However, there is one drawback if you are using Wordstar. Unless you install it for a specific drive, Wordstar forgets the location of the overlay programs once you change the logged disk and it starts referring to the drive "A" every time and anytime for almost any action other than getting characters from the keyboard, while "Newword" will continue to refer to the drive from which it is loaded.

I particularly like Wordstar and its relatives because it does not require use of arrow keys which are located in the separate cluster from the main keyboard. When you are touch-typing, removal of your hands from the main cluster is an interrupt and you have to restore the typing position of your hands and reload the necessary registers in your system neurons in preparation to resume the thought and typing process every time after moving the cursor just one step or two.

The instruction tells you to put the installation disk in the drive "B" and the system disk in the drive "A." It assumes that you have only two drives. This assumption is not true for many Sanyo users. In my Silver Box, I have four drives installed. The present configuration is: Drives "A" and "D" are 80 track drives, drive "B" is the 40 track job and the drive "E" is the 400K RAM disk. I can put all the word processing and spell checking programs in the system disk in "A" drive. The 700K disk carries the AUTOEXEC.BAT which contains the following commands:

```
MD80DA (Initializes 80 track drives "D" and "A")
COPY A:COMMAND.COM E:          (For a quick reboot)
COPY A:HDISK.DIC E:            (Copies HDISK.DIC)
COPY A:WS*.* E:                (Copies the three WS files)
LIGHT                          (Loads the Lightning)
E:                             (Changes the logged drive)
WS                             (Loads the word processor)
```

The above batch file puts me in the word processor with the Lightning installed all ready to work. If you have 360K drives only, you may have to store the necessary .DIC files in a separate disk and put it in drive "B." In this case, you have to change the drive names in the "Dictionary files" during the installation procedure to fit the setup.

### The Installation

When I attempted the installation for the first time, I loaded the installation programs in my RAM drive to speed up the process. The installation program assumes that the LIGHT.COM. the system program, is in the logged drive, therefore, you must select the drive where the LIGHT.COM is found and then type [ X:LIGHTINS ] using the drive name where the installation program rests, unless it resides in the same disk as the LIGHTINS.COM.

When the installation main menu opens, you should select the "Screen type" and set the type of monitor you use. I have a Panasonic color monitor and selected "COLOR 80x25." If you have a monochrome monitor connected to the video board, you should select B&W 80x25.

The next item in the menu is "Color." You can choose any color combinations you see in the palette displayed. One important principle in choosing colors is that you should avoid brilliant or flashy colors. This applies to both characters and frames. For frames you should select black background and I think this is a good practice to keep the overall brightness of the windows at a minimum. Otherwise, your eyes might suffer some degree of inflammation from watching blinking and flashing bright windows of intense colors!

The next item in the installation menu is the selection of "Dictionary files." I typed "NUL" for the "RAM dictionary." This name sets the condition for the Lightning to use the main dictionary in the RAM disk at all times. The second line is the selection of the name for the auxiliary dictionary in the system disk to keep it updated constantly.

The third line is the selection of the main spell-checking dictionary. I decided to use the RAM disk for storage of the spelling dictionary and typed "E:HDISK." (The original name for this file is DISK.DIC but I renamed it HDISK, adding the prefix "H," in order to use a simple copy command like "COPY A:H*.DIC".) This is the larger of the two spell-checking dictionaries with the size of about 170K. You should plan to use this dictionary in a RAM disk if you want the best checking efficiency.

The fourth and the last selection is for the *Thesaurus* dictionary of about 170K size. After using this dictionary in the RAM disk for a few days, I decided to keep it in the system disk, and save the precious RAM space dedicated to the RAM disk. You may not need it frequently and when you use it, you might as well take a time, sit back and have a taste of coffee in your cup. The time to get the synonyms out of this *Thesaurus* dictionary in a floppy drive is quite fast, about a second or two. You should enter "HTHES" without the drive name to set it to do this. The LIGHT will use the same drive name from where the program has been loaded.

The above arrangements enabled me to fit my word processor, the "Newword," together with the main spelling dictionary in the 400K RAM disk, which has the absolute maximum size I could use for the best all around operation. Currently, I have 736K effective RAM, old video board and the speed board with a V20-8. After installation of the three software drivers, the MLCLK.SYS, ANSI55.SYS, MLDISK.SYS with 400K space and the LIGHT loaded as a resident, I have about 220K left for the word processor to work in, although the "Newword" works best using 256K.

If you have free RAM space smaller than 256K for the program to work in, the Newword overwrites the high memory section of the COMMAND.COM. This means a disk access is necessary to restore the operating system. I put a copy of the COMMAND.COM in the RAM disk for a quick recovery as you have seen in my AUTOEXEC.BAT file.

### The Operation

After using the Lightning a day or two, I have the following to say. The numerous windows with brilliant colors are eye catching and a good approach to sell the program. However, when you got it on your screen in close proximity, you realize that the more glitter the windows have the harder the eyes suffer. As I've mentioned already, you better choose low key colors to protect your own eyes from the glare.

I found two things to improve on this program. One is the beep. Not just the audible signal, I also wish to have a little, blinking red dot on the right lower corner of the screen. I feel visual signal is much useful unless you have a volume control on the speaker. The blaring sound in a late night endeavor in the study is most unbecoming and often startling.

The second possible improvement is the method of corrections when you are in the page mode. As you correct the offensive word(s) it would be nice to jump to the bad word from any spot on the screen rather than moving the cursor manually. Since the location of bad word(s) must be held in a table, this would be an easy improvement as well as the first suggestion.

As I said before, the speed of spell-checking is just amazing but I also need the batch processing. I do not wish to spell-check each page I write. When I start to write I do not want to stop frequently. I have to stop after writing perhaps ten pages or more, and a short rest is necessary. When I resume the work, I want to reread what I wrote and this could be a good time to check the spelling, although I like to check the spelling when I finish a whole file. But, not one page at a time! Oh, mighty God of the expanding universe, please spare me from this task! The spell-checking speed is indeed spell binding, but, I may have to change my setup back to original if I could not get the Lightning to handle batch checking.

Yesterday, I noticed a tool for Lightning is being sold by Borland. The sentence on the cover said something close to the meaning that you get the source code. If it is the real source code for this program and not that of the tools, I may have to buy the package to repackage this marvelous spell checker to work on the files instead of the pages. One other thing I found is that the new edition of "Turbo Editor Tools" now carries a sample editor called "Microstar" which meshes with the Lightning to do batch checking of the files. Microstar reportedly comes with the source code in Turbo Pascal. This is another possible route to batch it.

### A Quark In The Lightning

There had been a function which I could not control until the second day of use. The "word replace" function did not work. I tried all the Environment files there were on the distribution disk. All to no avail, nothing happened. As I was using "Newword" program, I switched back to Wordstar. Same again, nothing happened when I selected a word in the "Sound alike word" list. The Word Table disappears and the cursor jumps back at the position where it was before the start of word checking.

The installation procedure includes mode setting for this word replacing function. It concerns the Insert mode and the Overwrite mode. The mode is used to write the corrected word correctly.

Well, the program was not doing what it was supposed to do. On the surface it did not do anything but my guess was that the program was doing what it was supposed to do but differently from what it should do. When I tried it in my Clumsy Clone, it still did not do anything other than remove one character on the word end, but, when I switched the environment to that of Sidekick the thing worked exactly how

**continued on page 258**

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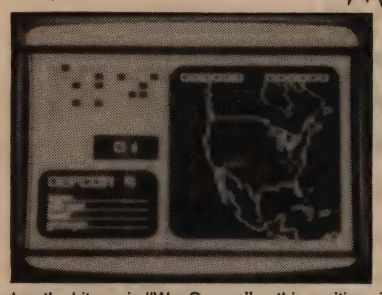

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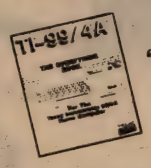


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# TEXAS INSTRUMENTS

## The Inner Limits

by Glenn Davis

When TI released its second version of TI-Writer to user groups, it included an additional file named Charal. The purpose of Charal is to give the TI a "real" lower-case character set instead of the squashed capital letters normally used.

Until I discovered what those characters actually looked like, I was anxious to get the update. Some characters, the asterisk and zero among them, looked really bad. The zero looked like "Gumby" with a lump on one side and the asterisk looked like a squashed insect, or maybe "Pokey" on a bad day. On a color monitor, the small "e" and "s" were hardly readable. It was almost as if TI wanted people to say "oh yuck!" and find out how to write their own.

Well, I slept on that idea, wondering how to modify the Charal file TI graciously sent us. Then, one day while I was playing around with a debugger searching GROMs of various cartridges to see what I might find, I discovered that the name Charal was in TI-Writer's GROM, not on the program disk. The implication of that was immediately apparent. Any TI-Writer cartridge will try to load Charal. TI-Writer subsequently loads the editor files, whether Charal is found or not. This is why the character set changes before the editing screen appears. Somebody at TI was really thinking when they designed that feature.

So, the Charal file is just a memory image file that is loaded where the Pattern Descriptor Table is in VDP RAM. Since this knowledge has been out for almost as long as the update of TI-Writer, many other programs also use Charal. Fast-Term by Paul Charlton is one example (you HAVE sent Paul some bucks for this fine "freeware," right?). This allows both the terminal program and the word processor to reside on the same disk and share Charal.

The files at the end of this article will allow you to create and modify your own version of Charal. Names of these files will be a little sticky, so please bear with me. Two different character sets are presented in the article. The first set will be referred to as the "TI" set. This set is very similar to the Charal set that TI sent out. I have made modifications to some characters, such as the numeral zero, which now includes a nice slash to allow easy distinction between it and the letter "O." The asterisk and some other punctuation characters are improved too.

The second character set I will refer to as the "Apple" set, since they are similar to the characters used by the Apple IIe and IIc computers. In this font, all characters are fully formed. No squashed "e" or "s." The capital letters are seven dots high. When a decending lower-case letter is above a full upper-case letter, there will not be any space. They appear this way on the Apples too. Having a decender above a capital letter is rare, though. The prime advantage of this character set is that the letters are large enough to be readable on a color monitor.

Before I tell you how to assemble these files, let's examine what other uses there are for "optional" fonts. Besides modifying characters at will, these fonts, can be used to create international fonts. My FX-80, for example, has nine different countries' character sets that can be selected by software. In each of them, selected punctuation characters are replaced by their foreign counterparts. With the German set, "{" becomes "ä" and "|" becomes "ö." By making appropriate adjustments to the TI of Apple fonts, these characters will actually appear as such on your screen. If you regularly use foreign fonts, placing small stickers on the keys allows easy access to these characters. Some printers allow "custom" characters, so just about any characters can be developed, even the Greek set.

Those of you with daisy wheels can do similar things. Diablo wheels (as one example) come in German, French, Norse, British, and Spanish. The instructions should indicate which ASCII codes print the foreign characters. Additional wheels may be available for other languages such as Russian, so check with your dealer.

Another way to make use of these fonts is to modify the control character definitions. Currently they are the ones used by TI-Writer. The <CR> symbol can easily be changed to a paragraph symbol or a broken arrow or anything else you'd like. The ASCII 08 character (backspace) can be changed to a reverse arrow (this character is accessed by pressing CTRL-U; SHIFT-H; CTRL-U).

Sometimes inverse characters are desirable for screen display, as when punctuation characters must match (braces, brackets, quotes, parentheses). Even making all of the control characters inverse may have benefits in certain situations. If you upload a legal character set (to a capable printer) or use a legal daisy-wheel, adding the copyright, trademark, and other legal symbols to any fonts would be ideal. In text-mode programs such as TI-Writer, inverse characters have their dot patterns reversed. So where an "on" dot normally is, put an "off" dot. And vice-versa. Technically, only the six left-most pixels are displayed, but inverting all of them has no ill effects.

Some people find TI-Writer's "features" are bugs. A frequently cited "feature" that people dislike is that TI-Writer puts two spaces after every period. Using alternate fonts, this feature is easily circumvented. Merely redefine some character (such as "|", the vertical bar, little used in most writing) as a period. An inverse period would be even better, making these periods easily distinguishable from the "ordinary" ones. Then (and this is the "trick") use the Transliterate formatter command .TL 124:46 near the beginning of each file. That changes the bar (character 124) to the period (character 46) when the formatter prints it. See the TI-writer manual if you do not understand how this command operates.

To assemble these files, begin with the source files all on one disk. Then load the Assembler. To assemble the TI font, use Charal/S. To assemble the Apple font, use Chara2/S. I use the convention of the TI-font files using a "1" and the Applefonts using a "2." Mixing them is not a good idea because the Apple characters are taller. Some files, i.e. the control character file, are shared. The source files have just Copy directives in them. Make sure the directives call for the files on the drive with the source disk in it. They are set up for DSK1 now. Use Charal/O or Chara2/O for the object files.

When that finishes, load the SAVE utility from the Editor/Assembler disk B and then the object file you chose to assemble through the Load and Run menu option. Press <Enter> again and the loader will ask for a program name. Enter SAVE. The save utility will give you some warning messages and prompt for another filename.

If you intend on assembling both of these fonts, name the TI set Chara-TI and the Apple set Chara-AP. Otherwise enter Charal (which makes it immediately available for use. You can then ignore the disk manager instructions below). When it finishes in a few seconds, use a disk manager to make a copy of the Chara-TI

**Program on Page 260**
**continued on page 261**

## The Source Hosts New TI-SIG

Source Telecomputing Corporation (STC; McLean, VA)—long a supporter of TI-99/4 users orphaned when Texas Instruments discontinued the model—now offers them a new, much improved "home." The new TI-SIG (special interest group) replaces TEXNET—the Source's pioneering 99/4 on-line user group, established in 1981—and adds a number of significant enhancements. It offers directories of SIG members; user groups; bulletin board systems; and a robust library of public domain software and shareware available for downloading. Registration on The Source Information Network is available for $49.95 (all prices suggested US resale) at participating resellers or direct from Source Telecomputing Corporation. Its lowest on-line charges (up to 50% lower than a leading competitor) are those it now charges for connection to most SIG features; these start at just 10¢ per minute ($6 per hour; $10 monthly minimum).

Source TI-SIG bulletin boards offer information on assembly, BASIC, Pascal, C and other languages; ads; hardware and software for sale; educational items; and shows or fairs of interest to 99/4 users. The TI-SIG library of public domain software and shareware for the 99/4 can be downloaded using XMODEM, TEII and other advanced file-transfer protocol for error-free file transfers. A popular TEXNET monthly on-line column, *Randy's Rumor Rag*, provides information on products, shows and other items of interest to TI-99/4 computer users.

Veteran SysOp (system operator) Blaine Crandell manages and coordinates the TI-SIG. Crandell has served as SysOp for TEXNET since 1981.

The TI-SIG joins a growing number of SIGs already on The Source for users of IBM PCs, Apple II/III and Macintosh™ computers. SIGs for users of Ashton-Tate and Microsoft products are also on-line.

The Source offers a wealth of easily accessible information and communication services. These include SourceMail (electronic mail for members), computer conferencing, a live Chat facility for real-time conversations among users, and more than 65 bulletin boards. The latest news and sports stories and feature articles are available on-line. The Source also offers a complete investor service, travel services, an encyclopedia, on-line catalog shopping, games and more. A unique on-line tutorial and introduction makes it easy for new subscribers to use the services on The Source, free of on-line charges.

For additional information contact Source Telecomputing Corporation, 1616 Anderson Road, McLean, VA 22102; (800) 336-3366.

Mention that you read about it in *Computer Shopper*. ●

# The TI Forum

by Ron Albright
& Jonathan Zittrain

### Quite a Year...

While I won't do a complete "year in review" piece now. I reserve the right to do one later. I want to look back at a few people who made major contributions to the TI community in 1986. In my eye, the biggest gift we received was from Canada. Clint Pulley's release of c99 made a version (albeit unlimited) of the computer industry's most popular programming language available to the 99ers. Several folks picked up on the gift and gave in return. Notably, my "guru," Warren Agee. Warren abandoned Forth and ran with c99 with a proliferation of helpfiles and code that has taught the TI world how to get c99 rolling. Hardware product of the year? Has to be Gram Kracker—the little box that cracked the GROM cartridge for all to see and hack away at it for the better. Runner-up? Horizon Ramdisk, which gave new meaning to "disk-access speed." Software product of the year? Since I like art, I give this category to Travis Watford who developed the means for the TI to use the hundreds of RLE graphic art pieces from Compuserve. TI users can now download graphics to the TI, import them into our own graphics software (Graphx or TI Artist) and modify them or whatever. Software producer of the year? Asgard Software which reaffirmed what Borland proved in the MS-DOS world—good products at reasonable costs will sell even in the face of rampant piracy. While others blamed falling sales to everything from piracy, track copiers, and disgruntled columnists, Asgard was a shining light of marketing genius. Best Publications? No way to decide this! If you are looking for up-to-date news and product reviews, it's *Micropendium* by a mile. If it's technical information, schematics and a close contact with European product development, it's the *R/D Newsletter* from Ryte Data. And if you want a novel publication with programs, tutorials, graphics and utilities already on disk in a menu-driven format, the *Traveler Diskazine* is an incredible value. I hope I can eat much crow with this (cough) "award," as I am writing it in September, before the Chicago Fair, but I award to Disappointment of the Year to Myarc—how long do we have to wait for the "new computer?" I have, frankly, found increasingly tedious the "R.S.N." ("real soon now") hype. As I said, I will be pleased to try and dine on a case of crow, my hat, and Myarc's doormat if the machine is available to the consumer before the end of 1986.

So there you have it. One observer's thanks and "awards" to those who have made 1986 the best year yet for the TI users. At the end of 1985, I asked myself, "What more could this hearty band of orphans possibly accomplish next year?" Well, guys and gals, you showed me. And I remain impressed. Can 1987 provide still more encores? Knowing the TI programmers and hackers as I do, the answer is a resounding YES!

Delphi is like a domed stadium in Columbus, Georgia. It's a nice facility, and the grandstands are real comfortable, and there is an excellent supporting team that plays there, but it sure gets lonesome being the only one there cheering. Ticket sales are almost nil. At least where the TI community is concerned. That is a shame too. It is an excellent system, with rates cheaper than Compuserve and the Source ($7.20/hour non-prime time which includes Tymnet charges and no surcharge for 1200 baud), no monthly minimum charges, an on-line encyclopedia (available at no extra cost), a gateway to Dialog (one of the largest databases in the world), and an electronic mail system that allows you to send mail to users on Compuserve and the Source. Add to that a well-staffed and run TI SIG (called the "TI Information Network"), and you wonder why they have not attracted more TI users (or users in general for that matter!). It would appear that the answer is, simply, lack of exposure. General Videotex (who owns and runs Delphi) seems to really believe that you have to merely build a good stadium (or on-line service) and people will beat a path to your door. No need to put up billboards or print maps for directions. People will just show up. Well, it hasn't happened that way. While Compuserve and STC spend big bucks on ads, I have never, ever seen an ad for Delphi. Have you? Its too bad too. I just stumbled on to Delphi through a friend and really enjoy the system. TIIN is supported by Dick Evans and Jeff Guide expertly, but they seem to be casting their technical and informative TI pearls upon barren astroturf. They have bent over backwards with a great sign-up offer ($10 for a password, reference card, and an hour usage credit). Here is a great bargain, if you are a subscriber to *Computer Shopper*, Delphi will waive the sign-up fee. Just give them your subscriber number from your label. I took them up on it and plan to hang around there often. Try it out. You don't have a thing to lose. To sign up (at least as of this writing in mid-September), call your local Tymnet number (no Telenet access to Delphi), at the "Please type your terminal identifier" prompt (the prompt is garbled at 1200 baud), enter "A". At "Please log in:", enter "Delphi". At "Username:", try "JOINTI99", and at "Password:", try "Teledata". You can sign up directly there. If this offer is no longer in effect, call 1-800-544-4005. Some day maybe General Videotex will spring for some ads and the world will find the way to the grandstands.

### Triton Still Around

Did you get your "Fall '86" Triton Catalog? They still have loads of TI stuff and, in particular, feature some good buys on Corcomp equipment (they, mysteriously, have dropped the Myarc product line) and TI cartridge software. If you didn't get one, write them at PO Box 8123, San Francisco, CA 94218.

### c99 Game Coming

In the January issue, I (RA) will be starting a mini-tutorial of a game I wrote in c99 called "CINVADERS" (get it? "C Invaders"?). Depending on how much other news I have to report in the coming months, it will run anywhere from 2 to 4 months—a little each time. It's not that long, but I will try to teach a little as we go along. Hopefully, I can talk my resident c99 "guru," Warren Agee, to make some comments or suggestions on how the code could be improved. Anyway, we'll start that in January.

### Converting BASIC to c99

When I started to learn BASIC (and later, Extended BASIC), I remember how I did it. I first typed in other programs from magazines and books. Then I started to do my own programs. And the first type of commands I used were the graphics commands. I sure didn't jump in with file handling or string manipulation! Anyway, I found myself doing the same thing with c99. I typed in some programs out of a book, then started playing with my own routines with graphics. Then I tackled a game. I have thought all along that if you can learn the logic involved in a game, you have learned a great deal about the programming structure of a particular language.

In this tutorial, we will try to accomplish a couple of things. First, a glimpse at some of the graphics commands available to c99 in the "grf1rf" library (that comes with all version 1.32 or higher), and, secondly, a look at how to convert a short BASIC graphics display to c99. It really isn't that hard.

Listing 1 is a short BASIC program from Ed York that has appeared in several UG newsletters. It is a colorful graphics display. Listing 2 is a conversion of the program to c99, done by me. They both accomplish the same thing graphically. I have commented the c99 source code to try and explain step-by-step what we did. I think as you look at the programs, you will see how similar both the graphics commands and the logic is between c99 and BASIC. It is, to me, much closer to BASIC than Forth was. See if you agree.

### Notes

[1] Compile the program with the compiler. Make sure the D/V 80 file "RANDOM:C" and "GRF1" is on disk 1, then assemble the output file. Then, load the assembler output (which should be a D/F 80 file), then from E/A option 3 still load the file "CSUP" (another D/F 80 file) and "GRF1" a third D/F 80 file. Then hit enter and use the program name "START". It should run.

[2] The only complicated move was separating lines 220 through line 300 into the separate function "fun()". This was done because line 300 in the BASIC program is a GOTO 220. Since there is no GOTO function in c99, we separate out those lines and use recursion in "fun()". Recursion simply means a routine calls itself over and over, just like a

continued on page 261

LISTING 1

```
100 REM COLOR BONANZA
110 REM WRITTEN BY:
120 REM ED YORK
130 CALL CLEAR
140 FOR A=40 TO 136 STEP 8
150 CALL CHAR(A,"55AA55AA55AA55AA")
160 NEXT A
170 FOR B=2 TO 14
180 CALL COLOR(B,1,1)
190 CALL VCHAR(1,2*B,24+8*B,22)
200 CALL VCHAR(1,2*B+1,24+8*B,22)
210 NEXT B
220 FOR C=2 TO 14
230 CALL SCREEN(INT(16*RND)+1)
240 FOR D=2 TO 14
250 CALL COLOR(D,D,C)
260 NEXT D
270 CALL KEY(0,E,F)
280 IF F<1 THEN 270
290 NEXT C
300 GOTO 220
```

LISTING 2

```
/* COLOR BONANZA This and the next 3 lines are REM's (line 100) */
   WRITTEN BY:                                        (line 110)
   ED YORK                                            (line 120)
   converted by Ron ALbright*/

#include dsk1.grf1rf /* required to use the graphics commands */
#include dsk1.random;c /* required to use the random number commands */

main()
  {
   int a,b; /* MUST declare ALL variables used in a routine at start */
   grf1(); /* MUST be used as first command for graphics library use */
   clear(); /* Same as CALL CLEAR (130) */
   randomize();/* Same as RANDOMIZE in BASIC */
     for(a=40;a<=136;a=a+8) /* Lines 140 and 160 ALL IN ONE STATEMENT! */
       chrdef(a,"55aa55aa55aa55aa"); /* CALL CHAR in line 150 */
       for(b=2;b<=14;b++) /* Another FOR-NEXT loop -lines 170 and 210 in one */
          { /* Mutilple lines in for loops need to be braced */
            color(b,1,1); /* Same as CALL COLOR - line 180 */
            vchar(1,2*b,24+8*b,22); /* Just a plain old CALL VCHAR! line 190 */
            vchar(1,2*b+1,24+8*b,22); /* line 200 */
          } /* Closed braces after FOR LOOP */

   fun(); /* Gets a little tricky here. Since there was a "GOTO" statement in
             line 300, I decided to make a new routine starting at where the
             GOTO directs the BASIC program - line 220. That way, I can call
             the second function from itself, in essence, creating a "GOTO".
             See below. Anyway, that is why I started a new function called
             "FUN()". I call it from the Main() routine here by just calling
             the name of the routine. Its just like I said GOSUB or, in XB, had
             created a user-defined SUB FUN and, here, said CALL SUB FUN. */

 } /* All of the main() */

fun() /* Start of a new function */
{ /* All functions start with an open brace */
     int c,d; /* Declare thoses variables at the start!!! */
     for(c=2;c<=14;c++) /* start of another FOR loop-lines 220,290 in one! */
     { /* multiple lines after a FOR need to be braced! */
         screen(rnd(16)+1); /* CALL SCREEN in line 230 */
         for(d=1;d<=14;d++) /* Start of a nested FOR LOOP - line 240 */
         color(d,d,c); /* CALL COLOR in line 250 */
         getchar(); /* Just waits for a key to be pressed - lines 270,280 */
      } /* Close that brace for the FOR loop */

     fun(); /* See that GOTO 220 in the BASIC program? This is the
               same thing - it just keeps calling "fun()" which is nothing
               more than the program starting at line 220.  so, by seperating
               the lines where the GOTO starts into a seperate routine, we can
               now call it over and every time we would be using the GOTO in
               Basic. */

} /* Close braces for fun() routine */
```

# HEATH/ZENITH

## Expanding Your Heath/Zenith PC-Compatible

by Ted Drude

This month, as usual, we've got a variety of topics. First, another software review. This time it's a new assembler package for the 8088/86: the A86 Macro Assembler and D86 Symbolic Debugger. Besides being (purportedly) the fastest Macro Assembler available for MS-DOS machines, A86 is a Shareware program that is very reasonably priced. As those who are familiar with Shareware probably know, low price doesn't necessarily mean less power. The A86 package is no exception to the rule, as this month's review points out.

Hardware hackers should find some interesting reading in this month's column, too. Robert Maskasky has produced some custom character generator ROMs for the 151 and 158 series color video boards that provide IBM compatible graphic characters in the Zenith single dot mode. We'll be taking a closer look at these ROMs this month.

### A86: A Fast New Macro Assembler for MS-DOS

For just about every programming language available in the MS-DOS environment, there is an ever-widening selection of different versions from which a programmer can choose. This competition has led to product improvement, and lower prices. Turbo Pascal and the Mix C compiler (reviewed here last month) are just two products of this type of competition.

One program, however, has been the dominant 8088/86 Macro Assembler for almost six years. It's the MicroSoft 8086 Macro Assembler (also known as MASM). MASM has controlled the assembler arena about like Lotus 123 and IBM mainframes have held onto their respective markets. Now, don't get me wrong. I'm not trying to be too critical of MASM. It hasn't kept its top standing without being a fairly good assembler. In fact, for heavy duty development work, it's not too bad.

The main problems I (and others) have with MASM are that it's far too bulky to use for small to medium-sized programs, and it's definitely NOT the easiest assembler to learn. The price, while in what MicroSoft would consider the lower range ($150), is still fairly high for casual users. And, although it's likely to remain the favorite assembler of heavy duty users for some time to come, MASM still hasn't caught the imagination of the masses, (like Borland's Turbo Pascal has, for example).

### Lookout MASM(?)...Here Comes A86!

If Eric Issacson has his way, though, the unchallenged reign of MASM as **the only** serious macro assembler for MS-DOS might come to an end soon. You see, Eric has just released his own Macro Assembler for MS-DOS:A86. He's priced it to be competitive (at only $40), and unlike some other low-cost assemblers, A86 has the features, and performance, as well as the price, to compete with MASM. Most of all, Eric has got the most efficient software distribution system in the world working for him: Shareware!

Before we look at the specific features of the A86 package in depth, let's take a quick detour that will give you some more background on this subject. This is especially included for those who may be wondering how A86 compares with some other inexpensive assemblers that are already out there.

### Shareware Assemblers: How Does A86 Compare?

For those who've been around a while, you will no doubt realize that A86 is not the first Shareware 8086 assembler to hit the market. David Whitman first wrote his CHASM (the Cheap Assembler) about three years ago, priced at $20, and released it to the Shareware market. Originally, CHASM didn't handle macros and wasn't very compatible with existing MASM source files. Still, CHASM allowed for a simplified syntax that was better for small programs and was also much easier for novice programmers to learn.

Although, CHASM suffered greatly from being a very slow interpreted BASIC program, it's low price has made it very popular with hobbyists and educators who found it an acceptable low priced alternative to MASM. The latest versions of CHASM are written in compiled Pascal, and considerably improved in speed. Reportedly, macros have also been added and registration is now $40 instead of $20.

Eric Tauck addressed some of CHASM's speed problems by releasing his own all-machine-Language 8086 assembler, WASM (the Wolfware Assembler). In addition to being quite a bit faster than CHASM, WASM had the additional plus of being slightly more compatible with some MASM source code. Although, WASM, like the original version of CHASM, doesn't handle macros, it's a public domain program, and has proved to be attractive to the same market that initially liked CHASM.

While both of these assemblers are adequate for learning 8088/86 assembler and writing smaller programs, they have several limitations that begin to show up when pressed into serious software development. The lack of a macro facility is only one problem. A more serious one is that neither assembler has a provision for handling the modular assembly of program files. This makes it difficult for a programmer to be able to write large programs in smaller modules, and debug them separately, or to create a routine library for use in many different programs (although WASM does allow for external source code files to be included to files being assembled).

Also, both assemblers are also limited in their ability to assemble standard MASM source code files. This is a more serious handicap in some respects, since there are probably thousands of megabytes of MASM-compatible source code floating around on PC-oriented BBSs and in magazines. It also tends to make these assemblers a little more difficult to learn initially, since most assembler tutorials are set up for MASM, and not CHASM or WASM.

### Back To A86...

Now let's get back to talking about A86. First of all, like

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## Survivors of The Clone Wars

by Peter Ruber

When personal computers first became popular, they spawned a support industry that ranged from magazines to independent software publishers to expansion hardware. As there were so many different computer systems popping up, each one requiring its own support industry, magazines were littered with a bewildering array of promises and solutions to everyone's computing needs.

Participants in this add-on market ranged from well-heeled high-tech firms to moonlighting engineers and programmers. The latter were often referred to as the computer "Cottage Industry," because they worked out of their basements and garages, hoping that the fall-out from the popular computer systems would be sufficient to bring them a piece of the action—and, perhaps, financial and creative independence.

Inevitably, when the tide turned toward the system standard advocated by IBM, many computer firms went under and their support vendors tumbled like a house of cards. And as systems folded, so did the magazines. The remaining ones, once bursting with ad revenues, slimmed down to pathetic ghostly remnants.

Zenith Data Systems was created out of Zenith's acquisition of the Heath Company, who launched the H-8 and H-89 computer systems. The H-89, in particular, was a versatile workhorse before it was discontinued in 1985 after a six-year run, having been eclipsed by Zenith's Z-100 dual 8085/8088 processor system and their Z-150 line of IBM compatible computers.

There were an estimated 250,000 H-89's produced over the years. This may seem a pittance to the estimated six million IBM systems in operation, but it had a fanatical cult following that continues to this day both among users and manufacturers of enhancement hardware. But that number far exceeds the sales of the Z-100. The Z-100 is a technically superior graphics machine to the IBM-PC (it has 192K RAM of screen memory) but its S-100 expansion bus wasn't totally compatible with the IEEE-696 standard, which effectively excluded it from using many available boards. Nor was it sufficiently IBM compatible to provoke much interest so that independent software manufacturers tended to ignore it.

Although I have three IBM compatible systems, I haven't abandoned my 8-bit H-89's. I recently picked up a used one, including an H-19 terminal, as back-up systems. For the time being, however, they're being used as terminals for my Ampro Little Board computers.

I still use my 5-year old H-89 regularly for many reasons. It's much more immune to power-line surges than my IBM clones, it has a razor-sharp CRT image, and I can pound on the keys without the system going into cardiac arrest, shortcomings of the clones.

But, more importantly, some manufacturers are still producing new hardware for the H-89 and that has transformed my system into a computer so powerful and versatile, that all my "clones" put together pale by comparison.

Right now, it's loaded with more than 3-Megabytes of RAM, three different hard disk interfaces, three co-processors, including an 11-MHz Intel 8031, an 8086 and an 80186, a high-resolution interlaced mode graphics card with its own 256k memory, three floppy disk interfaces that enable me to use up to 10 drives, including 40- and 80-track drives.

The firms responsible for some of these enhancements are among the survivors of the Clone Wars. And while their product lines now include enhancements for Heath/Zenith's line of IBM compatible systems, they continue to support the computer that made them successful.

As I frequently receive letters asking me to recommend ways of upgrading the H-89 for greater computing speed, on adding co-processors and Winchester hard disk systesm, I thought I'd devote an article to some of the key firms and in-

continued on page 262

# Multiple Column and Booklet Printing Program

by Norman Riger

A double column program reads a text file and prints it on paper in two columns. The text starts at the upper left and proceeds to the bottom of the page and continues from the middle of the top of the page until the bottom. The paper only travels through the printer once as both columns are printed at the same time.

This double column program is written in the CP/M version of Microsoft BASIC for the Heathkit H89 or Zenith Z-90 computer and an Okidata Microline 82A printer. The identical code also works with the ZDOS version of ZBasic on the Heathkit H-100 or Zenith Z-100 with the same type of printer. The program can be modified to run on other computers and printers. Modifications are included to provide three and four columns per page.

Double column programs are guaranteed to frustrate the most patient operators if the basic facts are not clearly understood. The capability of the printer is important and it must be properly connected and configured to avoid losing text. The Okidata 82A is an eighty column printer when using regular size letters at ten characters per inch. It can also print condensed type at 16.5 characters per inch, which provides 132 character positions across the page. If you want to use regular size type in two columns, you are limited to 38 or 39 characters per column depending on the amount of space between the columns. With condensed type, 64 or 65 character columns are possible. If you try to print longer lines than the printer can handle, lines from the right hand column will be at least partially mixed with the left hand column and the result will be difficult to read. If you have a wide carriage printer (132 columns at 10 characters per inch) or a printer with a longer line length (the Epson JX-80 can print 160 characters per line), you can print more columns or the line length of each column can be wider.

This program was written for a mail order dealer of used and rare books. Execution stops at the end of each page so that both sides of single sheet paper can be used in order to reduce postage costs. Remove this feature if you are only interested in printing on continuous forms. Printing address labels or merchandise price tags are other uses of the program. Many types of labels can also be printed for identifying collectibles, samples or research specimens.

The double column program is run by loading Microsoft BASIC, loading the program and using the command RUN. The operator is prompted for the number of lines per page and the name of the text file to be printed. The file is opened so it can be read from the disk. An array is set up which is equal to twice the number of lines per page. The array is filled (unless the file is too short) before anything is printed. The first line of the text file is then printed, starting at the upper left of the page and extending to almost the middle of the page. Then the top line of the second column is printed from the middle of the page to the right hand edge of the paper. The second lines of both columns are then printed and this process continues until the end of the page. Then the page number is printed at the bottom center of the page.

The program checks for the end of the file before every line is read from the disk. If the file ends before the array is full, the file is closed and designed to print one file after another and is stopped by a CONTROL C from the keyboard. If you only want to print one file at a time, add enough extra blank lines at the end of the file to fill up the array.

```
10 LPRINT CHR$(29),CHR$(27)+"8"
20 INPUT"LINES PER PAGE";A
30 DIM B$(A*2)
40 INPUT "FILE NAME";A$
50 OPEN"I",#1,A$
60 IF EOF(1) THEN 210
70 LINE INPUT#1,C$
80 B=B+1
110 B$(B)=C$
120 IF B=(A*2) THEN 130 ELSE 60
130 C=C+1
140 PRINT B$(C):PRINT"      ";B$(C+A)
145 LPRINT B$(C);TAB(66);B$(C+A)
150 IF C=A THEN 160 ELSE 130
160 B=0:C=0
170 D=D+1
180 PRINT:PRINT TAB(60);"page",D
185 LPRINT:LPRINT TAB(60);"page",D
190 INPUT"READY FOR NEXT PAGE (Y OR N)';F$
200 IF ASC(F$)=89 OR 121 THEN 60
210 CLOSE: GOTO 40
```

Figure 1

The text files to be printed must meet several requirements as follows. A carriage return must be the last character of each line. The line length cannot exceed the column width as described above. It is best to avoid any TAB characters in the file. Some word processors permit the replacement of tabs with separate spaces. Control codes for print formatting cannot be present.

The double column program does not justify the right hand margin of either column but text that is justified by the addition of complete spaces between words may be printed with success. Some printers have proportional spacing capability and this feature must be turned off when using the double column program.

Here is the source code, followed by a description of each line. (See Figure 1)

Line 10 sets up an Okidata Microline printer for eight lines per inch and condensed type of 16.5 characters per inch. Change this line according to the capability and type of printer you are using.

It may be necessary to add a line (15 WIDTH 255) here to handle columns longer than eighty characters (for the PC or compatibles: 15 WIDTH LPRINT 255)

Line 20 prompts the operator for the number of lines to be printed on each page. The use of very short lines is recommended when testing modifications in order to save paper and prolong ribbon life.

Line 30 sets up an array for storing the lines to be printed on the page. If you have less than 64K of memory, problems with the size of the array may result, depending on the system used.

Line 40 prompts the operator for the name of the file to be printed. If a word processing program isn't available for creating a print file, a routine can be included for filling the array directly from the keyboard.

Line 50 opens the file for reading text from the disk. The program may be modified to open two files so that lists can be merged.

Line 60 checks for the end of the file and initiates the acquisition of the name of the next file to be printed.

Line 70 reads one line from the currently opened file. This is a good place to add a routine for editing the line before it is stored in the array in case there are any typing errors or last minute changes to the text.

Line 80 is the counter for filling the array and is incremented each time it is run.

Line 110 stores the line read from the disk in the correct place in the array.

Line 120 checks if the array is full and initiates the reading of the next line or the printing of the page when the array is full.

Line 130 is the counter for recovering the lines that are stored in the array.

Line 140 prints the lines of text of both columns on the screen and may be omitted. Two separate lines are used on the screen so that all text will be visible.

Line 145 prints the lines of text of both columns on the printer.

Line 150 checks if all the lines have been recovered from the array and initiates the page number routine or the printing of the next line.

Line 160 resets the counters used for filling the array and recovering the contents of the array.

Line 170 is the page number counter which is incremented after each page is printed but before the page number is printed.

Line 180 prints the page number on the screen, and may be omitted.

Line 185 prints the page number on the printer. A blank line between the bottom of the text and the page number is provided by the extra LPRINT statement which may be removed according to your preference.

Line 190 stops execution of the program so the operator can change the single sheet page or print the opposite side.

Line 200 starts the program on the next page to be printed. Add ELSE 190 to the end of the line to make the code appear more professional. When the double column program is used as a subroutine in another program, this line may be used to exit the subroutine if the appropriate line number is included after the ELSE statement.

Line 210 closes the finished file and then the process begins with the next file.

The following modifications permit the printing of three columns per page. In lines 30 and 120 change (A*2) to (A*3), modify lines 140 and 145 as follows and don't forget to shorten the lines in the file to be printed.

```
140 PRINT B$(C):PRINT" "B$(C+A):PRINT"
    "B$(C+A+A)
145 LPRINT:LPRINT B$(C);TAB(43);B$(C+A);
    TAB(86);B$(C+A+A)
```

Four columns per page result when the following changes are made. In lines 30 and 120 change (a*2) to (A*4), modify lines 140 and 145 as follows and shorten the lines in the file to be printed.

```
140 PRINT B$(C):PRINT TAB(10);
    B$(C+A):PRINT TAB(20);
    B$(C+A+A):PRINT TAB(30);
    B$(C+A+A+A)
145 LPRINT B$(C);TAB(33);B$(C+A);
    TAB(66);B$(C+A+A);TAB
    (99);B$(C+A+A+A)
```

A few of the many possible modifications are provided and described to make the program more useful. One of the easiest is the addition of a personalized message at the bottom of the page, on the same line as the page number. An input statement is used to prompt the operator for the personalized message (line 175), which is checked for excessive length (line 176). Line 185 can be customized to position the message to the left or right of the page number.

```
175 INPUT"PERSONALIZED MESSAGE
    (58 CHARACTERS)";M$
176 IF LEN(M$) > 58 THEN 175
185 LPRINT:LPRINT M$;TAB(60);"page";D
```

This change allows you to print a different message at the bottom of each page. If you prefer the same message at the bottom of all pages, use line numbers 41 and 42 instead of 175 and 176.

If you are only interested in printing one file at a time and don't want to add extra blank lines at the end, try this change or keep a file of blank lines on hand at all times and remember the file name.

```
210 C$=" ": GOTO 80
```

The left margin of the page may be too narrow if you want to keep the printed pages in a loose leaf binder but this is no problem. Simply add spaces at the left of each printed line like this but remember to shorten the lines in each column accordingly.

```
145 LPRINT TAB(10);B$(C);TAB(76);
    B$(C+A)
```

The double column program can also be modified to lay out your text for small booklets. For example, you may want to print on both sides of a sheet of standard typing paper, cut the sheet in half horizontally and fold both halves vertically to produce a small eight page booklet by stapling the two sheets together. This makes an interesting project if you have a use for it and even larger booklets can be layed out and printed. If the array required to hold all of the text is too

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# Three From CE Software

by L. J. Kutten

One of the most prolific Macintosh software developers is Don Brown of CE Software. He is the author of the original Desk Accessory Mover, the versatile Mock Package which became part of Sidekick, and numerous other programs. Don believes in the honesty of his fellow man: nearly all of his software is shareware. He encourages everyone to freely copy and distribute his software. If you try and like it, you are honor bound to pay for it, otherwise you owe Don nothing.

This year Don has been exceptionally busy. He has developed three new programs. MacBillboard, MacBanner, and CalendarMaker, which belong in everybody's software library.

### MacBillboard

MacBillboard is a hybrid between MacPaint and PosterMaker. It lets the user draw pictures and then print them in sizes ranging from a quarter of a page up to 19 feet by 26 feet. While it is less powerful than MacPaint or Postermaker, it combines their most important features to create an extremely worthwhile hybrid.

The painting feature of MacBillboard operate very similar to MacPaint. Upon starting the program, the Graphics Editor Entry Zone (GEEZ) Window is displayed. It displays the working space and the various tools available. The working space is the visible window screen. More space can be generated by either using the hand grabber tool, the scroll bars, or scrolling an object. Most of the familiar MacPaint capabilities and tools are present. These include the lasso, marquee, invert picture, trace edges, flip horizontal, flip vertical, the adjustable paint brush and pattern selection box, the pencil, the line, the paint bucket, filled and hollow shapes, and the erasure.

Yet MacBillboard goes far beyond MacPaint. Features present in it and not in MacPaint include split window editing, automatic scaling (from ¼ size to 10X), magnification control, picture cropping, and selectable printing commands.

The printing commands are so remarkable they deserve further explanation. First MacBillboard can automatically print a picture inverted. This is much easier than trying to select the entire picture in MacPaint and doing the invert command. Second it has an automatic greeting card generator. Merely use the provided template (not in the shareware version) and print it out. The necessary quadrants are inverted so when the page is folded, everything turns out perfect.

MacBillboard requires either a Macintosh 512K, XL, or Plus. It is a memory hog and requires a full 512K of memory. Utilities that use a large amount of memory, such as a RAM disk, disk cache, and the like may cause it to crash.

MacBillboard is available via shareware, selected dealers and from CE Software. The shareware version does not contain the manual or any sample files. The dealer version costs $35 and contains the manual, and a number of useful printer templates.

If you think you will need this type of product, try it. Its price is a bargain when you consider that other commercially available programs with similar features can cost more than $150.

### MacBanner

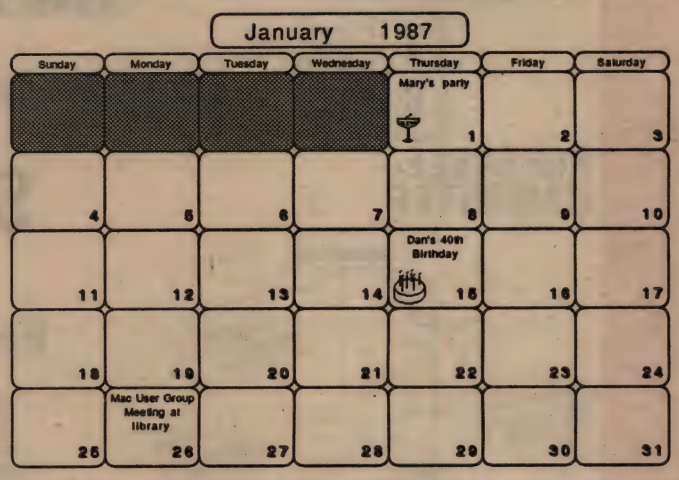
MacBanner is a useful program that lets anyone with an Apple printer generate customized banners that mix text and artwork. Simplistically it works by taking whatever is placed in its window, rotating it 90 degrees, and then printing it out. The text size ranges from a size 9 font all the way up to a leviathan size 72 font (it takes two sheets, one on top of the other to print size 72).

Using MacBanner is extremely simple. Merely boot it up and you are presented with five pull down menus and a fix-sized window for inputting art or text.

The pull menus include pattern, edit, font, style, and color. For an experienced Macintosh user, only pattern and color are new. Pattern lets you select from seven stock printing patterns. These in turn can be edited to give an almost infinite selection. The color capability lets you print out a banner in seven colors (black, red, green, blue, cyan, magenta, and yellow) on an Imagewriter II.

MacBanner is not without its limitations. It lacks a save capability. According to Don, he thought it was unnecessary as only simple banners would be printed. It will be added in the next release. Furthermore MacBanner is slightly incompatible with the LaserWriter: neither the "select printing pattern command" works nor can it print artwork that spans two or more sheets..

MacBanner works with all Macintoshes and all Apple printers. Color banners are only available using an ImageWriter II. MacBanner has a suggested retail price of $35.00. Unlike most of CE's other products, MacBanner is not shareware and should not be found on any bulletin board or user group library. However if you buy MacBillboard it comes included with it as an extra bonus.




### CalendarMaker

CalendarMaker is a program for creating and printing your own customized wall cal-

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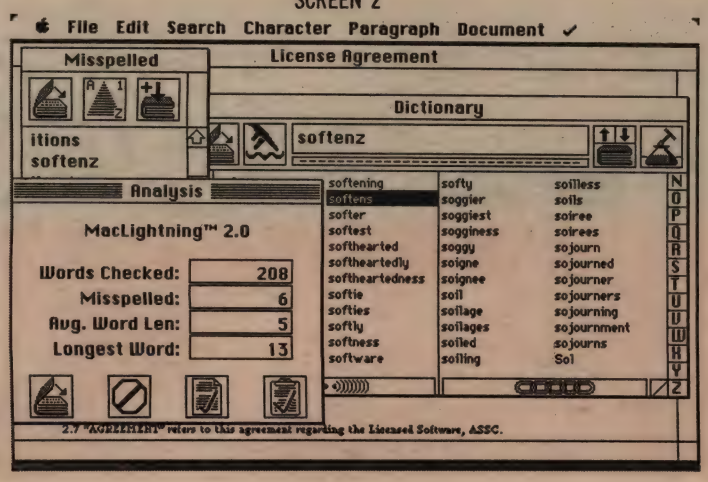
# MacLightning

Reviewed by L.J. Kutten

Every once in a while I come across a product that is so good, I pinch myself to make sure I have not dreamt it. Such a product is MacLightning, Version 2.0 from Target Software. This is easily the fastest, largest, and most accurate dictionary currently available for the Macintosh.

Simplistically MacLightning is a desk accessory and associated data files that either checks spelling interactively or selections of text. In the interactive mode, Maclightning checks as you type. If you type an unknown word it beeps. Hit the <COMMAND> <1> keys and the nearest word to your spelling will be looked up in the dictionary and displayed on the screen. Locate the correct word in the dictionary, click on it and MacLightning will erase your word and replace it with the correction. It does not matter if you are a fast typist. So long as <COMMAND> <1> is hit within 200 characters past a beep, the word can be corrected.

SCREEN 2




Even if the correct spelling is not on the screen and you do not know how to spell the word, MacLightning can aid you with its built in phonetic search capabilities. Assume for a minute you typed the word "fenomenal" MacLightning will beep and you pull up the dictionary. Click on phonetic search, and MacLightning will suggest eight words that sound the same, including the correct spelling, phenomenal.

In the non-interactive mode, MacLightning will check the text that is highlighted. Once it is done, it presents two windows. The first window is an analysis window that shows the number of words checked, the number of misspelled words (including duplicates), the average word length, and the number of characters in the longest word. The second window is a list of misspelled words in the order they were found. Clicking on a word in this list brings up the dictionary. The correction is the same as in the interactive mode except the MacLightning uses the program's "find and replace" routine to make the change.

**Maximum File Size:** MacLightning is the only dictionary that can proof extremely large Microsoft Word files. So long as the document can be placed in the clipboard, it can be placed. The upper limit is somewhere between 250K and 300K.

**Speed:** MacLightning is very fast. In the non-interactive mode it checked a 24,000 word document in 14 minutes while a one page letter typically takes

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# D.L. LIQUIDATORS A DATA LINK INC. COMPANY

## KYOTRONIC 85 PORTABLE COMPUTER

**Suggested Retail $599.95**

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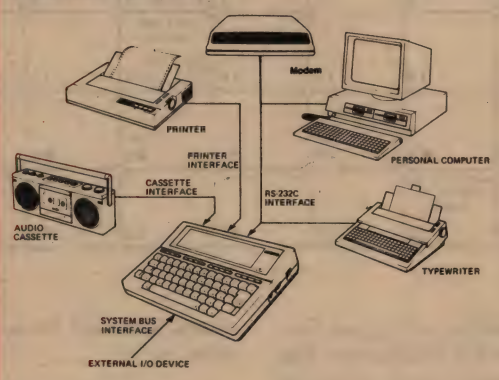
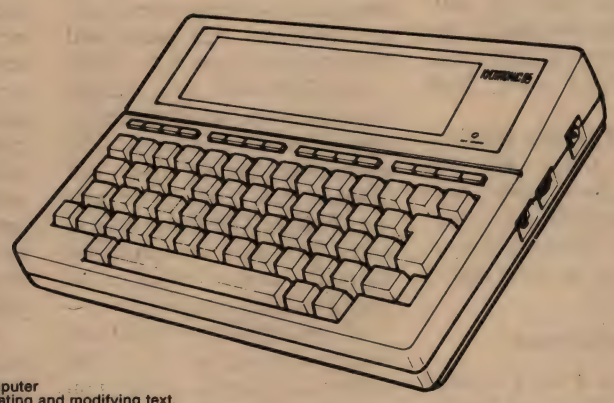



## Portable Word Processing



### Features

* Built-in application programs
  BASIC: The principal language to operate the computer
  TEXT: This function is a simple text editor for creating and modifying text.
  TELCOM: Telecommunication function. Terminal emulation of file up-load and down-load features through RS-232C interface.
* 2-way power supply by dry batteries or AC adaptor
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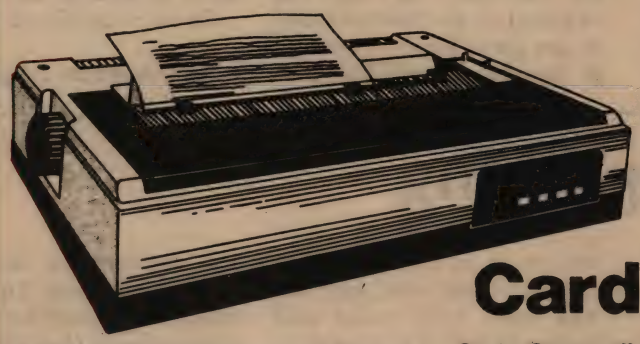
* Standard 16K-Byte RAM and can be increased up to 32K Bytes easily.
* Peripheral I/O Interface such as for printer, RS-232C and cassette recorder.
* Built-in Ni-Cd battery for RAM and clock function back-up.
* Auto power off function for saving the battery life.

**Printer:** Conforms to Centronics specifications

## Daisy wheel letter quality printer



**Liquidation Price $129.95**

**Suggested Retail $599.95**

## Cardco LQ/1

**Code Compatible with Diablo 1610/1620**

**Parallel Interface for Commodore 64 or VIC 20 add $24.95**

### Specifications

**Type:** Daisy wheel impact printer
**Main body:** Power supply, control board, printing mechanism, paper feed mechanism, carriage feed mechanism, control panel, operating levers and cover.
**Interface:** Centronics compatible parallel interface
**Printing speed:** 14 CPS (Shannon text with 12 pitch), 16 CPS in maximum
**Daisy wheel:** 96 characters
**Printing pitch:** 10 ch./inch, 12 ch./inch, 15 ch./inch
**Carriage movement:** 1/120 inch minimum
**Printing directions:** Bidirectional the shortest distance
**Carriage return:** 1200 ms/10 inches
**Printing width:** 101 ch./10 pitch, 121 ch./12 pitch, 151 ch./15 pitch
**Copy capacity:** 1 original + 3 copies
**Paper feed:** Friction feed system
**Paper feed speed:** 3.5 inch/second
**Line feed:** Controllable to 1/48 inch minimum by means of host computer
**Ribbon:** Multi-strike film ribbon (standard), One-time film ribbon, Fabric ribbon
**Control panel:** Switches - ON LINE, LINE FEED, FORM FEED, TOF SET
Lamps - POWER, ALERT, ON LINE
**Operating levers:** Paper release lever, Paper bail lever
**External dimensions:** 445 (W) x 122 (H) x 315 (D) mm. 17.5 (W) x 4.8 (H) x 12.4 (D) inches
**Weight:** 8.5kg. (18.7 lbs.)
**Noise level:** 65 dB or less (Scale A, 1 meter off)
**Reliability:** MTBF 2,500 hours (25% duty)
**Option:** Form Tractor

| Item | Price | Shipping, Processing, Handling |
|---|---|---|
| Kyotronic 85 | $149.95 | $18.00 |
| Cardco LQ/1 | $129.95 | $18.00 |
| Kyotronic 85 Printer Cable | $ 19.95 | N/C |
| PC Parallel Cable | $ 19.95 | With |
| Serial Cable | $ 19.95 | Major |
| Serial Cable to Computer | $ 19.95 | Purchase |
| AC Adaptor | $ 5.95 | |

| Print Wheels | Price | Shipping, Processing, Handling |
|---|---|---|
| Courier 10 | $10.95 | |
| Prestige Pica 10 | $10.95 | N/C |
| Courier 12 | $10.95 | |
| Prestige Elite 12 | $10.95 | With |
| Letter Gothic 12 | $10.95 | Maior |
| Script 12 | $10.95 | Purchase |
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# COMPUTER BOOKS

## Top 10 Computer Book List—December 1986

The following list includes titles that have been popular with *Computer Shopper* readers during the past month. The list is compiled by Info-Source, a mail order book seller and is not strictly the list of numerical best sellers nationwide. However, every title on the list is a best seller. If the titles listed are not available in your local bookstore, they can order them for you, or you can get them directly from Info-Source, Box 21092, Midtown Station, New York, NY 10129; (201) 595-4505

To all our readers, friends and customers, new and old, editorial and ad staff at *Computer Shopper*, Happy Holidays!!! and may there be a 68000 or 386 type marked specially for YOU!!!

***Running MS-DOS (2nd ED)***
Van Wolverton
Microsoft Press
$21.95
Pages: 500
Copyright: 1985

The second edition of this highly successful title is updated to cover MS-DOS through 3.1. This is truly the cornerstone book for any serious MS-DOS user's library. Quote *PC Week* "...written in that strange and wonderful tongue called English." Van Wolverton has worked at IBM and Intel. A similar title is the *MS-DOS User Guide* by Devoney from QUE [$19.95] and *Introducing PC-DOS and MS-DOS* by Sheldon from McGraw-Hill [$18.95]

***Inside AutoCad* 2nd Ed**
Raker & Rice
New Riders
$34.95
Pages: 309
Copyright: 1986

Raker and Rice tell the inside story of how to use AutoCad and they give a "hands on" feel for the program. Contents include Setting up AutoCad, Getting Around, Graphics Primitives, Introduction to Editing, Drawing Enhancements and much more. An easy step-by-step introduction with over 300 drawings explaining the use of AutoCad and handy references for setting up the program for professional drafting and design work.

***Understanding dBase III Plus***
Alan Simpson
SYBEX
$19.95
Pages: 415
Copyright: 1986

dBase Commands and concepts are illustrated throughout the book with practical, business oriented examples—for mailing lists, accounts receivable and inventory design—Plus scores of expert tips and techniques. *Understanding dBase III Plus* covers interfacing with Lotus, Visicalc, WordStar and upgrading from dBase II. Other titles include: *Mastering dBase III Plus* [$22.95], *Advanced Techniques in dBase III Plus* [$22.95], *dBase III Plus Programming Tips and Techniques* (Ashton-Tate) [$19.95]

***Commodore 128 Programmers Reference Library***
CBM
Bantam
$21.95
Pages: 745
Copyright: 1986

This reference guide by Commodore from Bantam Books, is for anyone using the new and powerful C-128. The 128 has many exciting features including CP/M, superior sound, graphics and sprite handling. The book covers many features of the machine and contents include: Basic Building Blocks, Basic 7.0, Programming the 80 column chip, CP/M on the 128, Memory Maps and C-128 hardware specifications, just to mention a few chapters in this comb bound 745-page reference book. Other titles include *COMPUTE!'s 128 Programmer's Guide (COMPUTE!)* [$16.95]. *Your Commodore 128* [$14.95], *Mastering Disk Operations On The Commodore 128* (Sybex) [$15.95], *Mapping The Commodore 128 (COMPUTE!)* [$14.95]

***Using 1-2-3* 2nd Ed**
(Includes release 2)
LeBlond
Que
$19.95
Pages: 540
Copyright: 1986

This new edition of the classic *Using 1-2-3* highlights changes well. 125 extra pages and a tear out chart are now included. This title must surely rank amongst the greats when it comes to **good** books on 1-2-3. Other titles in this series include *1-2-3 Macro Library* (2nd ED) [$19.95] and *1-2-3 Tips, Tricks and Traps* [$19.95]

***Supercharging MS-DOS***
Van Wolverton
Microsoft
$18.95
Pages: 352
Copyright: 1986

Van is back! *Running MS-DOS* sold 300,000 copies! Now *Supercharging MS-DOS* takes readers several steps further in understanding and using MS-DOS. Users primarily in the business and university market who have a basic understanding of MS-DOS will want to explore its intermediate possibilities. In a style that has been praised by reviewers and computer users [as well as booksellers!] Wolverton shows users how to customize the behavior and appearance of MS-DOS compatible machines.

***MS-DOS Developers Guide***
Angermeyer
Howard Sams
$24.95
Pages: 435
Copyright: 1986

For any serious programmer developing software for MS-DOS applications this title is packed with interesting tips

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## Best of the "Backlist"

For readers of the *Computer Shopper* Popular Computer book column, seeing that it is the time to reflect, look back and all that, here is a random selection of what we, at Info-Source, regard not necessarily as "the best titles" of the past 12 to 18 months, but as those that, as booksellers, drew our attention and caused comment.

Please note that the books mentioned are seen through the eyes of booksellers slightly more biased towards books than computers.

First, the obvious titles in the computer book field.

Van Wolverton: *Running MS-DOS*. This title has become a standard title to help introduce new comers to MS-DOS, a marvelous title, written in an English that is not wrapped up in computer jargon. First release, 1984, the updated edition in November, 1985 seemed to be even more successful.

Peter Norton: *Peter Norton Programmer's Guide To The IBM PC*, as with *Running* another very successful title from Microsoft Press. Norton, with sleeves rolled up, has proceeded from his very successful *Inside the IBM PC* [Prentice Hall], to this title, and the success continues. A valuable book to have, especially for the more advanced MS-DOS programmer. This title has sold 115,000 copies since it was first released.

Titles that were not on the best seller lists and which seemed to sneak onto the bookshelves almost unnoticed, but subsequently received attention, include:

*Programming Pearls* by Bentley, published by Addison Wesley and reviewed in the October edition of *BYTE* magazine, "...while there may be many books on programming, there are few collections of tricks of the trade, *Programming Pearls* is the best collection I've seen." [Michael O'Neill] One of those quiet, unassuming titles, that professionals and academics are enthused about.

Jon Bently's column by the same name has appeared in the Journal of the CACM since 1983.

What caught some booksellers totally by surprise, which might just show how some of us get locked into certain DOSs, was the surge of interest shown in the revised and updated editions covering PC DOS V3.0 and 3.1. Some of the forerunners in these titles were Que's *Using PC DOS* by Chris DeVoney and *Introducing PC DOS* by Sheldon, published by McGraw-Hill.

With the announcement from Compaq of their 80386 machine, one of the few titles around is a rather graphic curve upwards in sales, Murray and Pappas have written the *80386/80286 Assembly Language Programming* published by McGraw-Hill.

From Addison-Wesley was the news of their *Apple Technical Library* and for those who had not yet heard the roar, *Postscript Language Reference Manual* and *Postscript Language Tutorial and Cookbook*, made their appearance. Then when you got into Laserprinting and all that, along came *Tex Book* and *The Megafont Book*, and the wonderful *Tex Library*. [All by Donald Knuth of Stanford University, and who has written the TEX typesetting software package (Please, Prof., when will you complete the *Art of Computer Programming?*)]

This has been the year of Amiga. Publishers have not been too slow to react to the fact that an affordable, graphic based machine was now on the market. A pleasant surprise came from Bantam Books with excellent titles on Amiga DOS and the C-128.

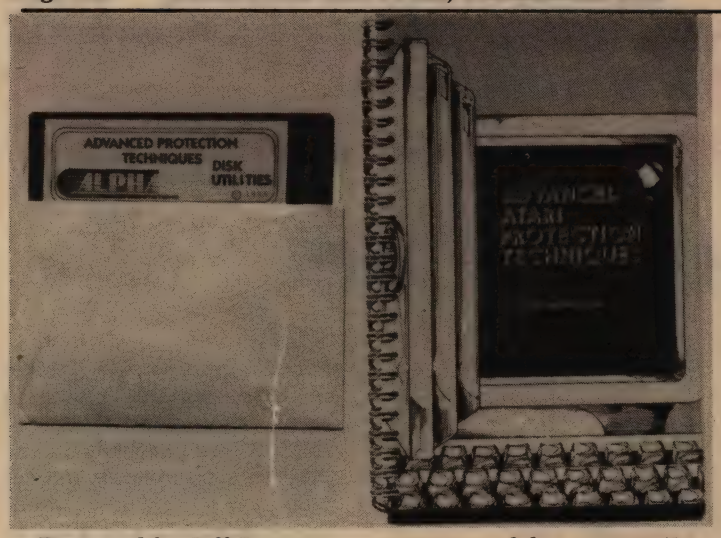
Speaking of Commodore, *COMPUTE!* was never far behind, and has brought out some excellent titles on the Amiga as well as the C-128. The *COMPUTE!'s 128 Programmers Reference Guide* and Amiga *DOS Reference Guide* spring to mind. Again, Addison-Wesley has come to the fore with the very impressive *Amiga Technical Reference Manual's*. Consisting of Hardware, Intuition, ROM Kernal: Exec and ROM Kernel: Libraries and Devices—similar to the *Inside Macintosh* books in level, style and content. Que, Sybex and other publishers all have Amiga titles worthy of note.

The ST was covered with good titles from Sybex, *COMPUTE!* and McGraw-Hill, amongst others.

Space permitting, it would be easy to ramble on, however, just as these titles have come to mind, so, we are sure, some notable titles worthy of inclusion, have been omitted. For these omissions we apologize in advance.

Happy Holidays! ●

# Advanced Protection Techniques




Reviewed by Jeff Brenner

After a delay of several months, Alpha Systems has finally begun shipping its *Advanced Atari Protection Techniques* book/disk package. A sequel to the original *Atari Software Protection Techniques* published in 1983, *Advanced* presents more recent copy protection techniques and news. Both books are intended primarily for programmers interested in protecting their software, but are also interesting for anyone who merely want to learn about the clever techniques used to thwart software pirates.

### The Book

The 161-page *Advanced* book is significantly larger than the 101-page original book, but contains much less meat on the actual topic of copy protection, probably because most of the popular copy protection schemes have already been discussed in book 1. For example, Chapter 1 is entitled "Motivations," and breaks down software pirates into personality types, such as hackers, collectors, "belongers" and profiteers. Chapters 2 through 4 discuss how the software gets into the hands of pirates in the first place: by purchasing, through company insiders, computer shows, the mail, bulletin boards, etc. Chapter 4, in fact, diverges from the topic of software altogether as it discusses "phone phreaking," or making free telephone calls illegally. The reason for this discussion, the manual claims, is that "phreaks who do get involved for financial reasons (free phone calls) are also the most likely to be involved with software piracy."

By Chapter 5 we finally get a taste of some disk protection techniques. At this point, the book shows the steps a pirate takes in creating an illegal copy of a program, and then reviews the various means of protecting programs mentioned in volume 1: self-modifying code, encryption bad sectors, CRC errors, bad data marks, duplicate sectors, etc. Next, the advanced techniques are discussed in detail: Advanced directory hiding (more complex than the directory hiding of the original book), overfilled tracks, short sectors (a sector with less than 128 bytes), and unstable sectoring (phantom and fuzzy sectors).

Chapter 6 presents "Advanced Cartridge Protection" and Chapter 7 is "Cassettes Revisited." Both of these chapters will be useless to a majority of programmers, since very few people are still producing cartridge or cassette-based software.

Protection for on-line systems is discussed in Chapter 8. We learn how hackers use back doors and fake log-on tricks to gain illegal access to on-line systems. A number of protection techniques are proposed.

Chapter 9 deals with the law, and discusses methods to obtain legal protection for programs, such as obtaining a copyright. This chapter also has sections on The Uniform Commercial Code, software licensing, patents and new trends in software law.

Chapters ten and eleven describe additional program protections, and the new problems with software protection that are being created with the flexible operating systems of the XL/XE computers.

The following chapters consist of reviews of various hardware and software backup utilities, including the Happy Enhancement, the 1050 Duplicator, the Archiver/Editor chip, Scanalyzer, the Impossible and The Super Pill. A glossary contains definitions for many of the unusual terms used in the book.

### The Diskette

A diskette is included with *Advanced Atari Protection Techniques* and consists of a number of utilities that can be used to add protection to your own programs or to examine other programs. On the diskette you'll find a disk editor, binary file protector, encryption/de-encryption file, and a text file containing the latest news in software protection. The disk editor can be used to modify sectors, scan for protection on a diskette, or to mark sectors on a disk as "in use" (by modifying the VTOC) so you can add your own copy protection. The Protect Binary File option allows you to add passwords to your binary file programs, or to encrypt, limit use, or check sector status. The Decrypt/Encrypt file will code a file based on the password you give it. The file can then only be uncoded with the same password.

A nice feature on the diskette itself is the protection demos. Sector 690 on the diskette, for example, contains a standard bad sector, sector 692 contains a duplicate sector, etc. Samples of a short sector, a CRC error, a bad data mark and an unstable sector are also included. Owners of Happy-enhanced drives (or compatible) can copy the track containing these protected sectors to their own disks and then check for whatever protection is desired.

### Conclusions

*Advanced Atari Protection Techniques*, while very readable and well-written, is much less focused on the actual protection methods than in the original book, and contains an excess of filler. Readers of the original book will have been expecting a lot more in terms of new techniques to protect software. Nonetheless, even the inappropriate chapters make for interesting reading.

One of the problems with a book such as this one, of course, is that software pirates have the same access to it as anybody else. It is even conceivable that the book was actually written for the large number of software pirates in the Atari community. Even so, the book still provides valuable information for the small software developer and the interested Atari user. At $24.95, I rate the package as overpriced, but software developers, and fans of the original *Atari Software Protection Techniques* should certainly consider it.

Requires: 8-Bit Atari Computer Disk Drive, Author: George Morrison, Helen Prozialeck, George Polly, John Liang.

Price: $24.95 for book/disk package. Warranty: 90 days, free replacement. Manufacturer: Alpha Systems, 4435 Maplepark Road, Stow, OH 44224. ●

# The CP/M Plus Handbook

Reviewed by Michael A. Banks

CP/M, the venerable operating system for microcomputers, has been praised and cursed in equal measure. The praise has been for its flexibility and power, and for the fact that so many programs have been made available—especially in the public domain—to operate under CP/M. The cursing has to do mainly with the confusing protocols required by CP/M, and for its complexity (an unfortunate by-product of power).

*The CP/M Plus Handbook* is an attempt to unravel the mysteries of working with CP/M in its latest incarnation, CP/M Plus, also known as CP/M 3.0. There are more than a few titles which claim to accomplish this, although for earlier versions. (The only other book that covers CP/M Plus in as in-depth a fashion as this one does is *The Users Guide to CP/M Systems*, by Tony Bove and Cheryl Rhodes which focuses on all versions of CP/M currently available.)

The author, Alan R. Miller, works from a solid base in showing the novice CP/M user the mysteries and intricacies of CP/M Plus. Miller has worked with CP/M since the first version—1.3—was released, and has used it with many popular microcomputer systems. He is the author of an earlier volume, also from Sybex, titled *Mastering CP/M*, which is a little more technical and less specialized than this book.

*The CP/M Plus Handbook* begins with some very basic information on microcomputers the first chapter reads like a high school-level text on microcomputer hardware and software, and is apparently included to ensure that the reader knows the terminology that Miller will be using. This seems extraneous, considering the fact that anyone who is going to be using CP/M should already be familiar with the basic operation of and terminology associated with a microcomputer. The discussion of how disks are structured and how disk drives operate may provide most users with some valuable information, however.

The meat of the book begins with Chapter 2, which is titled "Learning to Use CP/M Plus." This chapter walks the reader through the basics of system operation, including booting, control characters, editing lines, file names and directories, duplicating disks for backup purposes, as well as copying individual files. Some elementary PIP operations are also illustrated, and the user has some experience with COPY, COPYSYS, and FORMAT by the chapter's end. The language and technical reading level here and thoughout the rest of the book are the same as in the first chapter, which is just as well; considering the complexity of the topic, any approach that simplifies understanding is to be welcomed.

Chapter 3 expands upon commands, and introduces transient programs. Chapter 4 is dedicated to PIP, and Chapter 5 to ED. Chapter 6 rounds out what is a fairly effective user tutorial with a detailed technical overview of the CP/M Plus system. There is more detail in this chapter than most users will need, but it is the sort of detail that one will be glad to find, should the need ever arise.

The final chapter of the book, which covers some 55 pages, is an alphabetical quick reference to CP/M Plus commands—"COPY" to "XREF." This is the portion of the book that will be thumbed through frequently; this type of reference is almost worth the price of the book on its own, and it distinguishes this guide from many others that are and undoubtedly will be in print. Each command carries a one-line listing of its application(s), and a fairly detailed description of its operation, followed by an example of its use. The reader is referred to the appropriate chapter for more information. These references range from one to eight pages, depending upon the complexity of the command.

Although the price of $15.95 seems a bit steep for a book of this size, it is less than many similar books, and a fair value for the price. Beginners who need to know more about their CP/M Plus operating systems are advised to use this book.

*The CP/M Plus Handbook*
Alan Miller
Sybex Books
2344 Sixth Street
Berkeley, CA 94710
$15.95 ●

# MISCELLANEOUS

## Ampro's SCSI/Plus: A Proposed Standard For I/O Bus

by Peter Ruber

There has been an on-going debate for nearly a decade about the creation of a universal standard for interfacing computers to I/O devices and to each other.

However, the same group of engineers who beat the war drums for standardization are torn between their own personal concepts of what constitutes an I/O architecture and what the marketing departments of the companies they work for perceive as the ideal way to capture a significant market share for their products. For better or for worse, marketing seems to have the final say, because it is their responsibility to move the product onto the dealers' shelves, and from there into the hands of the consumer.

Occasionally a new design concept emanates from the drafting table, and marketing has to scramble to find a market for the product. But more often than not, even while the new product is in production, design changes are implemented to either cut production costs or to add some features that will enhance the visibility of the computer in terms of an attractive price or more power for the buck.

This tug of war certainly hasn't helped to implement a universal I/O standard; and since prevailing attitudes in certain segments of manufacturing still persist in forcing consumers to purchase peripherals with proprietary interfacing schemes, any movement to create a universal I/O standard will certainly be a hard fought battle.

There are some critics who have been saying in recent years that computers are becoming like appliances. That is, you plug them in and they do the work for you—that you don't have to know anything about programming or understand how even the most elementary principles of connecting peripheral devices. This simplification of use certainly hasn't hurt the computer sales, even though it has fostered wide spread illiteracy because manufacturers have been loath to reveal very much about how their machines function. The segment of the market that is interested in the technical details can usually find out what they want by what is published in magazines that foster support for a product, or through books.

And while computers have, in a sense, become like appliances, they really don't share the commonality of other appliance devices. Stick an MS-DOS disk into a Macintosh and you'll see what I mean. Even though certain personal computer systems cannot communicate with each other or share program files, there is a certain loose standard through which they communicate with their peripherals. Floppy drives, serial printers, modems, parallel printers and hard disk drives, do have a defined set of I/O and control lines. But that doesn't necessarily mean that the connecting cables from a PC system will work on an Apple. That's because the engineers who design the ports on the back of the computers don't always use the same control lines (or handshaking schemes) for communicating with devices.

From the software viewpoint, the first standard to emerge as personal computers became popular was CP/M. This disk operating system provided a basic set of routines by which computers could talk to their peripherals and therefore benefit from being able to use more sophisticated programs created by large teams of programmers, rather than the simplified utilities that had been available for the many different proprietary operating systems used by these computers.

CP/M created not only a revolution within the computer industry, but also a shake-out of manufacturers, much in the same way IBM shook up the industry by using its enormous marketing clout to establish PC-DOS (or its generic parent MS-DOS) as the new standard for communicating with peripherals.

This change was certainly meteoric because it almost wiped out the CP/M industry in short order. CP/M might have fared a little better or have been able to exert its influence over enough of a market to create a kind of peaceful co-existence with MS-DOS, were it not for the fact that when it originally became popular, most computer manufacturers could not agree on a universal way to format the floppy disk media. They even altered the BIOS to complement their hardware designs. And for a half-dozen or so years we had formats that ranged from single-sided hard sector to quad-density soft sector, each with its own scheme of laying down the tracks on a disk.

When the advancing technology for hard disk drives made it possible for individuals to buy these mass storage devices at affordable prices, there was even more confusion. No one could agree on a standard of communication, even though they were considered parallel devices that transmitted data through 8-bit bytes. Each hard disk drive required its own personal hard disk controller board to operate, and customized software drivers to access the channels of communication.

The first step in creating some kind of order out of this chaotic situation was made by Shugart Associates, one of the leaders in drive technology in their day. They designed a simple standard I/O bus interface through which computers could access the controllers and hard disk drives, as long as this standard was on the controller board. It was called SASI, and during the early 1980s it was probably implemented on more systems than all others combined.

But it failed to gather total support from all manufacturers of hard disks and controllers, because SASI stood for Shugart Associates System Interface. The ANSC Committee of manufacturers, whose purpose it was to establish the electrical properties of

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# TIMEX/SINCLAIR

## Sinclair Survival Column

by Mark L. Fendrick

Well, here we are again at the end of another year and we still haven't given up on our computers. In fact, more has happened in the Sinclair world this year than has happened in any single year since this column began. Therefore, before we say Hello to 1987 lets have a look back at 1986.

We began the year with the QL just becoming available from Sinclair dealers. Previously it had only been available through Sinclair US or American Express (if you happened to have an American Express card). The QL had originally been introduced at a price of $499.95, but when a price cut became necessary in the U.K., the U.S. model (which had just been released) went down to $299.95.

Of course, the biggest story of the year was the sale of Sinclair Research, Ltd.'s (SRL) computer business to Amstrad, its largest competitor in the UK. This move came as somewhat of a surprise even though Sinclair had been having financial troubles. Earlier in the year it looked as if Clive Sinclair was going to sell the majority of his stock to British newspaper publisher, Robert Maxwell, bringing some business acumen to Sinclair Research, but Mr. Maxwell's advisors aborted the deal after studying SRL's books.

But SRL started to pull itself back into the black shortly thereafter, signing a new marketing deal with Dixons, a chain operation in Britain. With a long-term commitment to the Sinclair computer line, SRL was able to start paying off some of its debts and return to profitability. It looked as if Sinclair would continue to be a force in the innovative high technology field.

But things did not work out for SRL the way Sir Clive had hoped, and in a surprise move in April, Sinclair sold the rights to its current computer business to rival, Amstrad. No longer could Sir Clive use the Sinclair name on future innovative computers. Amstrad now had the rights to that name along with the Spectrum, Spectrum +, and Quantum Leap (QL). In one stroke, Amstrad owned the largest percentage of the British home (non-business) computer market.

Sinclair Research Ltd. now underwent a reorganization with such new projects as wafer scale integration in the works. The Pandora laptop was spurned by Amstrad, seemingly ending that project before it was realized.

The U.S. market, which had never seen a Spectrum or Spectrum + was concerned only about the future of the QL, which was just getting off the ground in terms of American sales. A + Computer Response had purchased the entire stock of American Sinclair products just prior to the sale, and now came out strongly to support the QL. A network of authorized dealers was set up to sell, service and support the computer.

All of this is the standard fare for Sinclair owners, and we have stuck together over the years to support each other. The Sinclair Computerfest held this year in Cincinnati proved that fact. When one saw the gathering of the faithful, both dealers and users, one had to be encouraged about our future. We may not have Sinclair behind us—but we in this country never really did in the past. It is the dealers and Sinclair owners themselves who are the glue that keeps us together.

So what is still happening for all of the Sinclair owners still using their computers? Once again we wrap up the year with a look at the current

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# Desktop Publishing Prepares For Big Move Into PC Environment

by Ken Fermoyle

Apple and Macintosh have dominated the desktop publishing field since the Mac + LaserWriter + new page composition software combinations created the market two years ago. Mac's uncontested rule of the field is about to end, however.

A whole series of hardware/software developments will dramatically increase the amount of desktop publishing done on MS/PC-DOS equipment during the coming year.

Here are just 12 of those developments:

1. Hewlett-Packard makes most of the laser printers used with MS-DOS computers and is preparing some new products, including its Document Description Language (DDL) for debut before year-end.

2. H-P at press time was readying a new, more capable LaserJet Plus printer with more LaserWriter features, but at a price reportedly $1000 to $1500 less than the Apple printer.

3. Spellbinder Desktop Publisher, on the market for over a year, has proven to be highly usable—and is being enhanced to make it even better.

4. Aldus prexy Paul Brainerd promises that the PC version of PageMaker, the big seller for Macintosh systems, will appear before 1987 arrives.

5. Ventura Publisher will be a Christmas (or early New Year) present for the PC from Xerox.

6. LaserScript from Command Technology Corporation also has been available for some months—and offers a batch mode, non-WYSIWYG alternative that eliminates page-by-page layout.

7. Several companies not known as computer manufacturers, have complete MS/PC-DOS desktop publishing systems in the wings. AST (maker of Six-Pak and RAMpage boards) has one that includes its new Turboscan scanner, Turbolaser printer, scanner/printer interface card, third-party page composition software and an AT clone.

8. Power Text Formatter, has been available as an inexpensive text-only entry to desktop publishing for MS/PC-DOS users since 1985. Priced at about $90, it's surprisingly powerful—and soon will be able to incorporate graphics.

9. Companies other than Hewlett-Packard are readying laser printers with lower prices and more features—and most of them are designed more with an eye to the MS-DOS family than to Macs.

10. More makers of phototypesetters offer software that allows PC-generated files to be printed on their equipment. This means you can get resolution or 750 dpi and better for use in high-quality printing.

11. A number of new scanners priced under $2000 are being readied for the MS-DOS market. (Canon offers one for $895.) None yet match Thunderscan, the $250 scanner currently for Macs only.

12. Finally, Windows, GEM and Topview provide the graphics interfaces that can make PCs and clones act more like Macs until IBM introduces its own new line of graphics-based PCs.

### Market Turnaround Predicted

(Rumors are that such machines could be ready in the second quarter of 1987. One rumor is that Windows will be part of the operating system, perhaps as an option.)

The point about scanners is more important than many realize. Those devices, with their ability to read text, artwork and photos from hard copy into computer files, are tremendously important to the future of desktop publishing. When useful 300 dot-per-inch (dpi) scanners are available at $500 or less, watch out! They broaden the field significantly.

These developments, plus the millions of IBM PCs already in corporations, made one computer industry research analyst predict recently that the market will turnaround completely by 1990.

The analyst is Ajit Kapoor, director of electronic public market analysis for Dataquest, the computer industry research firm in San Jose.

He thinks that while approximately 85 percent of the desktop publishing market has been in the Apple Macintosh environment, "you're going to see the whole thing turn topsy-turvy by 1990—about 85 percent will be on the IBM standard."

Others in the industry agree that IBM's huge installed base of computers owned by businesses eventually should give them an edge over Apple. After seeing the market blossom in less than two years, however, they don't feel this will mean Apple will have fewer sales—just a reduced market share.

There also is a great deal of disagreement on how quickly IBM can topple Macintosh as boss in desktop publishing. Some point out that, despite all the recent developments, Mac still has a clear advantage over MS/PC-DOS machines in many ways.

First, IBMs and compatibles need something like the Windows interface to approach a Mac's graphics capabilities. You also have to add a mouse and improved graphics to make full use of the popular Page Description Languages and desktop publishing software.

Second, PCs and XTs are marginal in terms of speed and memory without turbo boards and extended memory cards. Consider that they have 4.77 megahertz clock speed and 640K of RAM, compared to 7.83 megahertz and 1 megabyte (expandable to 4MB) for the Macintosh Plus. Even IBM's AT models have slower clock speeds than Macintosh, and only the same amount of addressable RAM as PCs and XTs.

Remember also that most of IBM's installed base of micros consists of PCs and XTs, not the faster, more powerful ATs. So some money must be spent to upgrade if desktop publishing is to be done properly and efficiently with such programs as PageMaker and Ventura Publisher.

Third, Apple's LaserWriter is still one of the more capable laser printers available, and shapes up quite well against the competition in its price class. It is fully compatible with all IBM machines and clones.

Sure, more laser printers are popping up regularly but the others will be playing catch-up for a while, especially if Apple can drop prices as competition increases.

### Will WYSIWYG Software Prevail?

In talking to end users at CORPCON 86 in Los Angeles this fall I uncovered another interesting viewpoint. It's simply this: although page-oriented desktop publishing programs draw most of the attention right now, that won't continue indefinitely. Many are convinced that "style-guide" or document-oriented software that runs in a batch mode will prove better in the long run for many users.

WYSIWYG is the hot buzzword in desktop publishing now. Pronounced "wizzywig," it means "What You See Is What You Get." It's one of the features that creators of such page layout programs as PageMaker, Spellbinder and Ventura Publisher brag about in ads and publicity releases.

They describe how you use icons and mice to manipulate text, type and graphics on a page "to get it just the way you want it." In effect, you turn the monitor into a layout board. Your mouse and keyboard become computer equivalents of layout tools: Xacto knife, waxer or glue pot, T-square, steel rule, triangle and so forth.

The whole process of page layout parallels manual methods, but the computer makes it a lot easier.

Anyone who has toiled over a drawing board on manual pasteups in the past has to love the WYSIWYG way of preparing documents.

The question is, do page layout publishing systems make best use of a computer's intrinsic capabilities? The answer, for many types of jobs, is "probably not."

If you're doing 2-page flyers, 8-page newsletters or 16-page brochures, using lots of art, or want to try a variety of jazzy layouts, WYSIWYG is the way to go. No question. Designers

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# In Defense of BASIC

by Scott Statton

I've heard now over the last several years a multitude of nay-sayers demeaning BASIC. I would like to take a few moments to defend this often maligned language.

I began programming in BASIC in 1978 when I purchased my first microcomputer. For the next four years this was my primary language of operation for two reasons. Firstly it was very easy to use. I could directly translate ideas and concepts into code very quickly. I didn't need the entire concept drawn before me as in a more structured language. The syntax was easy and straightforward. Secondly, it was always available in ROM. I turned on a switch and the ever familiar "MEMORY SIZE?" prompt flashed at me. Tap return. Start programming. It was that easy. If I wanted to test a theory I didn't have to load a floppy. I didn't have to muck around with a text editor, submit that to a compiler, and then execute the results. It was instant. Furthermore, BASIC was universal. It was not absolutely portable, but even today nothing is. I could walk up to most any computer and tinker around in BASIC.

Because BASIC was so simple to use, I could constantly try new ideas. I would read a concept implemented in some other high level language and then use this in my BASIC code. I would store boolean values in variables for condition testing, used extensive subroutines etc. Structured programming is not a feature of the language, but the programmer. Just as I can write absolutely cryptic "C" code, I could write very clean, well documented BASIC. (Any beginning C student will attest that while (not(*t + + = * S + +)); can be pretty confusing). All BASIC is not a plate of spaghetti. It's just an easy pit to fall into.

Perhaps BASIC would not have been so ubiquitous had it not been burned permanently into hundreds of thousands of computers in ROM. Let's face it..if it didn't come with BASIC in ROM it just wasn't a computer. Why, even the venerable HP-2000 used BASIC exclusively. In fact Hewlett-Packard was instrumental in making BASIC as commonplace as it is today. It was their philosophy that computers should be tools available directly to the end user, and BASIC would be the language endusers could learn quickly. The BASIC implemented on the HP-3000 is the most advanced form of BASIC I have seen to date.

Some of my most creative programming has been in BASIC and I conjured up many concepts I still use as a professional programmer. Today, it seems that programming in BASIC is a type of computer astrology. Something that honorable, thinking programmers barely acknowledge and no one would ever admit to using.

Until something as easy to use as BASIC comes down the pike there will still be thousands who use it daily.

For more information contact: Starpoint Software, Star Route, Gazelle, CA 96034. ●

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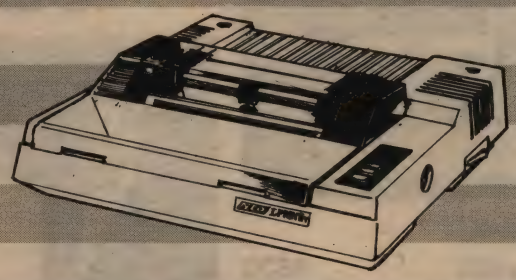

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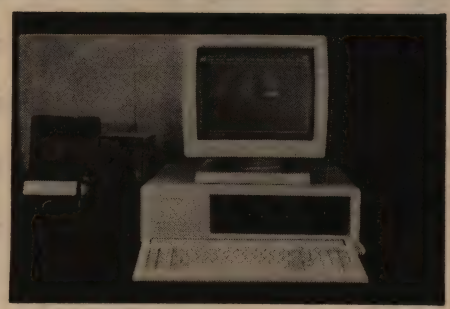

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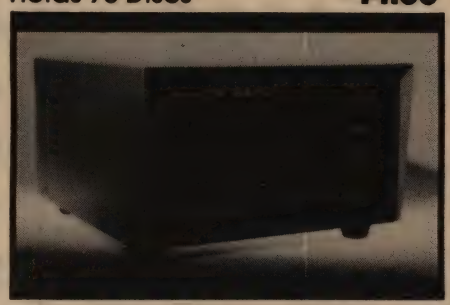

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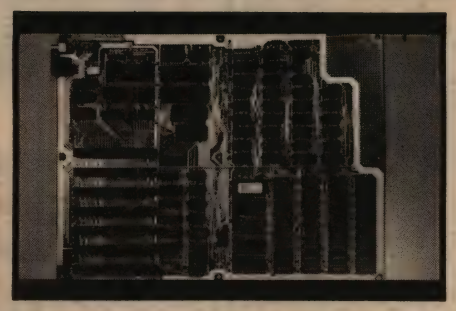

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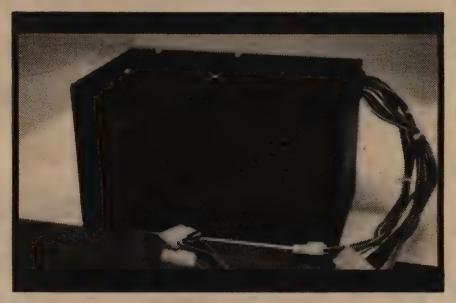

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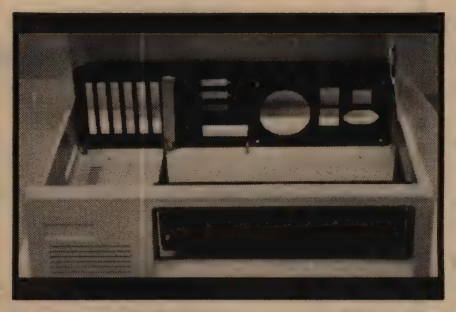

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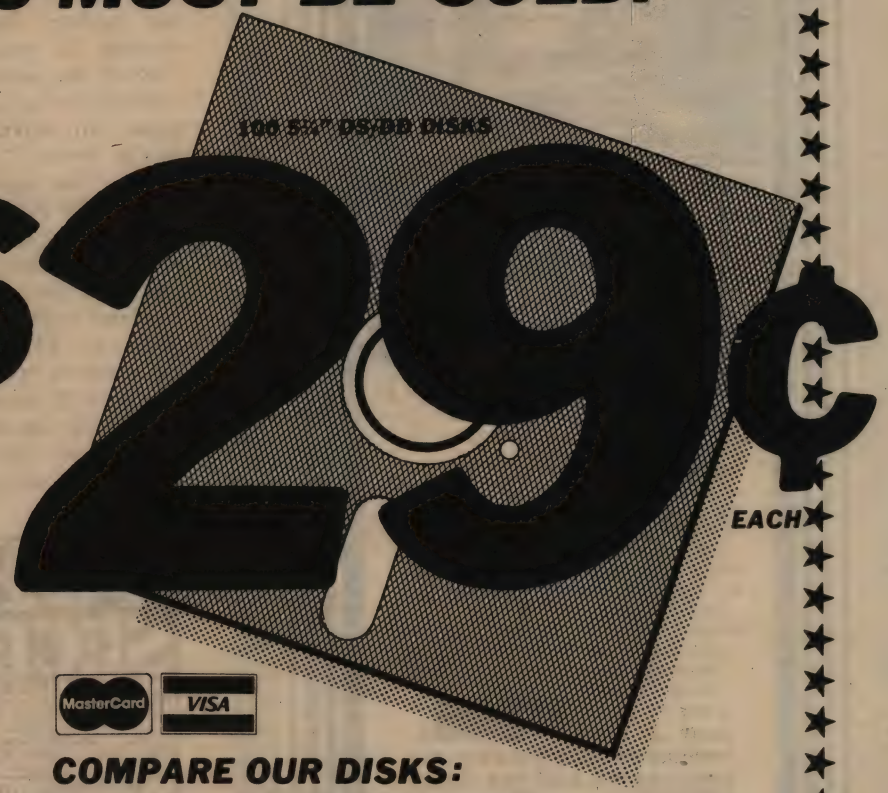


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**A★Star continued from page 99**

above come with the computer. Four double "A" alkaline batteries serve to keep the clock and calendar current. They also keep the CMOS RAM alive. This contains the information that you supply during a SET UP routine found on the set up disk. This identifies the various accessories and options that you have selected for your computer. One of the routines supplied with the set up automatically parks your hard disk when you power down. It makes some sense to use regular batteries that can be replaced with no special effort but I wondered about re-running the set up routine when the batteries were due to be replaced. I can be fast but I've never out run an electron yet. Checking around with some of our service techs in the area I find that if you don't dwadle around when you change the batteries the CMOS RAM is seldom lost.

Documentation with the computer is not what I am used to by a long shot. It is complete and well written for those that want to know how this thing works and how to set it up. I've pulled one of the pages from the User's Manual (see insert) that shows the layout as you look down into the case. This one page alone eliminates a lot of the confusion often experienced in computer documentation. All the connectors are shown and clearly labeled. The rest of the manual includes basic specifications, available accessories, set up instructions, configuration, drive installation, card installation and operation. With very little, or even no, prior knowledge about computers you can take this manual and a boxed computer and before long be up and running.

Whoever wrote these manuals knew how to present this material in such a way that I find it hard to believe you could have trouble putting the A★Star into operation. IBM's BASICA.COM included with DOS 3.1 will not function properly with the A★Star but a replacement is available that simply needs to be copied up to the hard disk and you are in business. The 230+ page (8½x11) manual with the A★Star BASIC is equally well written. As a matter of fact it is worth reading from cover to cover for the material alone. The manuals are multi ring bound and will lay flat folded open on the desk. I would like to see more companies follow the lead that Wells American is setting for documentation. How many times have you had to juggle a manual next to a keyboard because it wouldn't lay flat and open to where you needed it?

Another nice feature is included with the purchase. By returning an enclosed certificate to Wells you can obtain a free set of schematics for the A★Star.

Unfortunately I didn't have the A★Star long, as it had to be returned. I did run a number of programs to see how they would function. I used the following: The Smart System, dBase III, LeScript, Electric Webster, Reflex, Word and Norton Utilities.

These ran with no problems short of having to push myself to keep up at times. I could get accustomed to the higher speeds in a hurry. The model supplied was the 30MB A★Star Model 300 with a full sized Seagate Technology hard drive. 512K memory expansion (a total of 1024K), 6/8MHz 80286 CPU and a multi func-

**continued on page 140**


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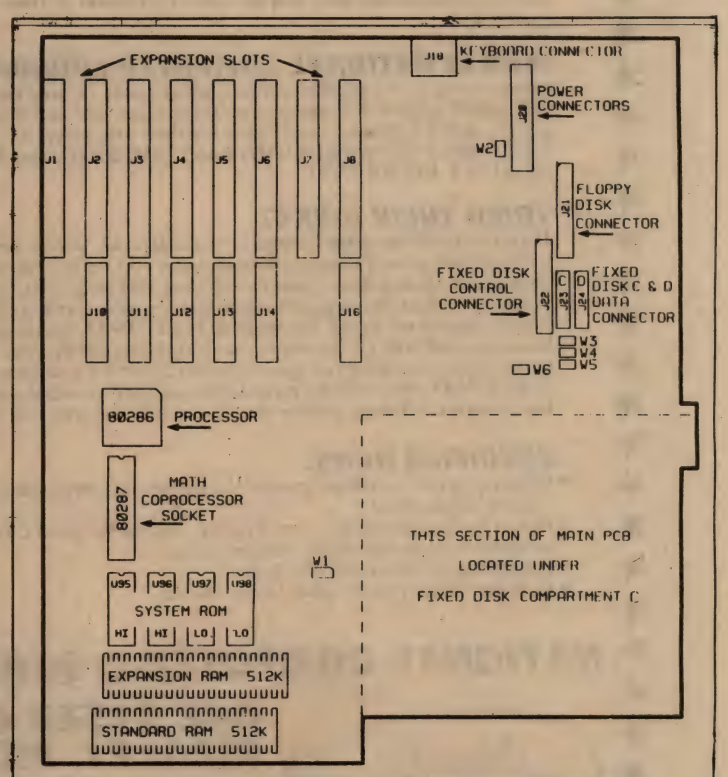
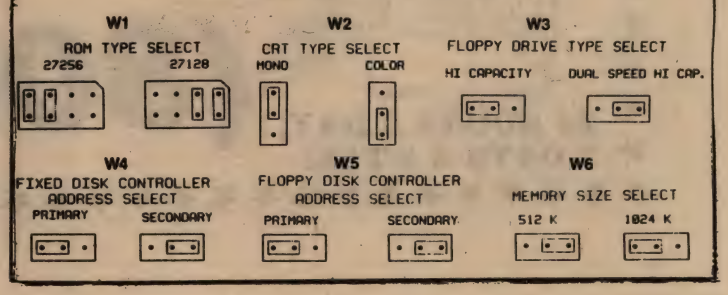
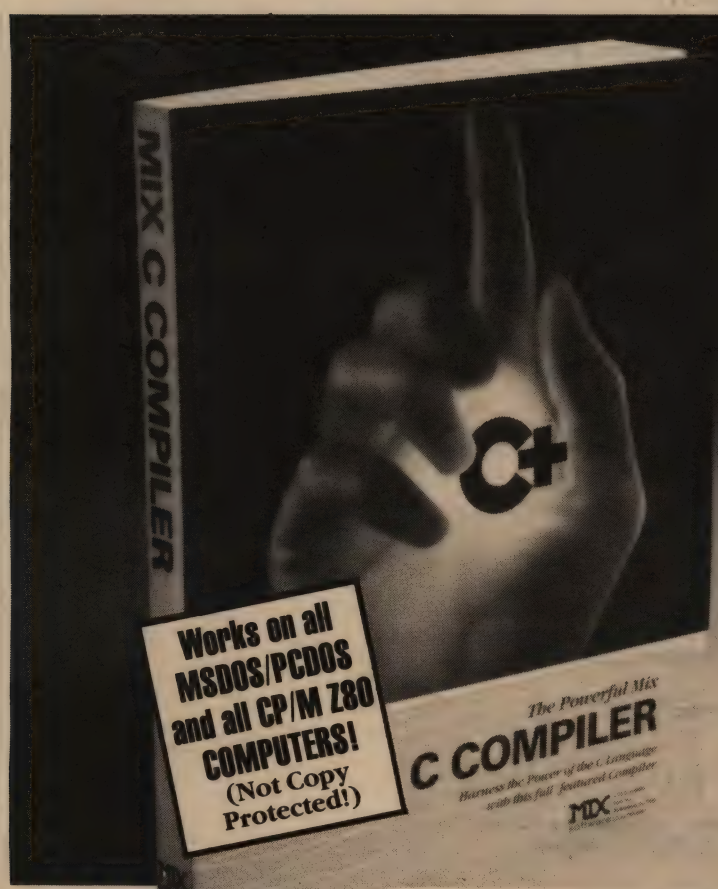



FIG 2 — Top View of Main Printed Circuit Board (Motherboard) looking Down From Front of Unit.



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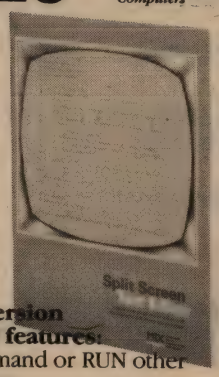

Our high powered editor is great for editing high level languages. **It works just like Micropro's Wordstar,™** but macros allow you to create your own custom editor, and the split-screen feature lets you edit two files at the same time.

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Program: Benchmark For Epson Equity III

```
#include (dos.h)

main()
{
  unsigned long int b,e;
  int t_i_add,t_l_add,t_f_add;
  int t_i_sub,t_l_sub,t_f_sub;
  int t_i_mul,t_l_mul,t_f_mul;
  int t_i_div,t_l_div,t_f_div;
  unsigned long int systime(),elapsed_time();

  printf("\nADDITION TESTING        - using integers...");
  b = systime();
  int_addition();
  e = systime();
  t_i_add = elapsed_time(b,e);

  printf("longs...");
  b = systime();
  long_addition();
  e = systime();
  t_l_add = elapsed_time(b,e);

  printf("floats...");
  b = systime();
  float_addition();
  e = systime();
  t_f_add = elapsed_time(b,e);

  printf("\nSUBTRACTION TESTING     - using integers...");
  b = systime();
  int_subtraction();
  e = systime();
  t_i_sub = elapsed_time(b,e);

  printf("longs...");
  b = systime();
  long_subtraction();
  e = systime();
  t_l_sub = elapsed_time(b,e);

  printf("floats...");
  b = systime();
  float_subtraction();
  e = systime();
  t_f_sub = elapsed_time(b,e);

  printf("\nMULTIPLICATION TESTING - using integers...");
  b = systime();
  int_multiplication();
  e = systime();
  t_i_mul = elapsed_time(b,e);

  printf("longs...");
  b = systime();
  long_multiplication();
  e = systime();
  t_l_mul = elapsed_time(b,e);

  printf("floats...");
  b = systime();
  float_multiplication();
  e = systime();
  t_f_mul = elapsed_time(b,e);

  printf("\nDIVISION TESTING        - using integers...");
  b = systime();
  int_division();
  e = systime();
  t_i_div = elapsed_time(b,e);

  printf("longs...");
  b = systime();
  long_division();
  e = systime();
  t_l_div = elapsed_time(b,e);

  printf("floats...");
  b = systime();
  float_division();
  e = systime();
  t_f_div = elapsed_time(b,e);

  printf("\n\nTime used in int addition   : %4d\n",t_i_add);
  printf("Time used in long addition  : %4d\n",t_l_add);
  printf("Time used in float addition : %4d\n",t_f_add);
  printf("Time used in int subtract   : %4d\n",t_i_sub);
  printf("Time used in long subtract  : %4d\n",t_l_sub);
  printf("Time used in float subtract : %4d\n",t_f_sub);
  printf("Time used in int multiply   : %4d\n",t_i_mul);
  printf("Time used in long multiply  : %4d\n",t_l_mul);
  printf("Time used in float multiply : %4d\n",t_f_mul);
  printf("Time used in int division   : %4d\n",t_i_div);
  printf("Time used in long division  : %4d\n",t_l_div);
  printf("Time used in float division : %4d\n",t_f_div);
}

unsigned long int systime()
{
  unsigned int lo,hi;
  unsigned long int t;
  unsigned int far *ptr;
  ptr = 0x046C;
  lo = *ptr;
  ptr++;
  hi = *ptr;
  t = (hi*65536) + lo;
  return(t);
}

unsigned long int elapsed_time(start,finish)
unsigned long int start,finish;
{
  return(finish - start);
}

int_addition()
{
  int x;
  long int i;

  for(i=0; i(100000; i++)
    x = 2767 + i;
}

long_addition()
{
  long i,x;

  for(i=0; i(100000; i++)
    x = 65535 + i;
}

float_addition()
{
  float x;
  long int i;

  for(i=0; i(100000; i++)
    x = 65530.12345678 + i;
}

int_subtraction()
{
  int x;
  long int i;

  for(i=0; i(100000; i++)
    x = 32767 - 12345;
}

long_subtraction()
{
  long i,x;

  for(i=0; i(100000; i++)
    x = 987654321 - 123456789;
}

float_subtraction()
{
  float x;
  long int i;

  for(i=0; i(100000; i++)
    x = 8765.87654321 - 5678.12345678;
}

int_multiplication()
{
  int x;
  long int i;

  for(i=0; i(100000; i++)
    x = 1234 * 25;
}

long_multiplication()
{
  long i,x;
  for(i=0; i(100000; i++)
    x = 1234 * 5678;
}

float_multiplication()
{
  float x;
  long int i;

  for(i=0; i(100000; i++)
    x = 1234.12345678 * 12.87654321;
}

int_division()
{
  int x;
  long int i;

  for(i=0; i(100000; i++)
    x = 32766 / 12345;
}

long_division()
{
  long int x,i;

  for(i=0; i(100000; i++)
    x = 987654321 / 12345678;
}

float_division()
{
  float x;
  long int i;

  for(i=0; i(100000; i++)
    x = 8765.12345678 / 1234.87654321;
}
```

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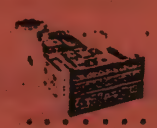

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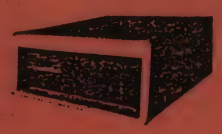

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**Epson Equity III**
**continued from page 100**

appear within the software itself. While most of todays clones are able to directly boot up using PC-DOS, none of them run BASICA unless someone made an illegal set of BASIC ROMS (it has been known to be done). Despite the widespread use of Turbo Pascal and the various C compilers, there are quite a few people that still like and use BASIC. For you, Epson has inIncluded GW-BASIC with their MS-DOS operating system. The documentation accompanying the Equity III consists of two books, and one of these books is totally dedicated to GW-BASIC.

**MS-DOS**

Epson supplies Equity III owners with Microsoft MS-DOS version 3.1. Also accompanying the operating system is a diagnostics diskette and several utility programs related to hard disk management.

One utility provided for the novice user is XTREE, a file and directory management program created by Executive Systems, Inc. of Sherman Oaks, CA. The program is designed to enable novices to easily traverse directories and run programs without much training in PC-DOS.

Most of the other files are a one-on-one duplicate of PC-DOS programs, although a few of which have been renamed.

Most of the clones today contain ROM BIOS code so compatible with IBM's that the manufacturer actually recommends the use of off the shelf PC-DOS.

If your system requires a customized version of DOS and the manufacturer goes out of business, upgrading to a new version of DOS, (whenever it is made available), would be all but impossible. Could you imagine trying to operate under DOS 1.x anymore?

I'm happy to report that the Equity III ran just fine using a standard copy of IBM PC-DOS 3.20. I was unable to find any compatibility difficulties with either the hardware or software.

**Overall Performance**

Realizing that the Equity III is not built for ultra high performance (remember the slow 6MHz clock speed?), one might wonder just how fast it actually is. Since it's a clone, I decided to test it against a clone.

In order to evaluate the unit, I wrote a simple, straight forward benchmark program (see the listing on page 138). The program simply performs 100,000 interations of each type of simple math functions involving three data types: the integer, the long and the float.

The comparisons were made against a PC Clone running a NEC V20 chip at 4.77MHz, a PC Clone running a NEC V20 chip at 8.00MHz and an IBM AT running 6MHz.

The numbers appearing below represent timer ticks, or approximately 0.0549 per count. The actual time involved in carrying out an instruction is not as significant as is its time relative to another system. For that comparison, the benchmark on page 138 should be quite adequate.

As you may have surmised, benchmark times for memory intensive operations were relatively identical for both the IBM AT (6MHz version) and the Equity III. Overall, the Equity performs at a rate approximately twice as fast as a turbo PC clone and three times faster than a standard PC.

I also ran Core International's Disk Performance Test Program on the factory supplied fixed disk on the Equity and discovered the following statistics concerning the drives:

Data Transfer Rate: 165.7 KB/sec
Average Seek Time: 89.8 ms
Track-Track Seek: 17.8 ms
Performance Index: 1.599

**Conclusion**

For those seeking highest performance in an 80286 based system, the Equity is not the perfect choice. The Equity III is very compatible, so much so that its hardware performance matched almost identically to the IBM AT. Its slower clock speed makes it compatible with anyone's peripheral add-ons.

One outstanding feature of the Equity is its superb tactile AT style keyboard. It's the first clone keyboard I wouldn't mind tacking onto the end of my home unit.

The documentation which accompanies the system is adequate for most users, although it contains absolutely no technical information concerning the hardware itself.

For those persons wanting to get into the AT arena but are intimidated by the unknowns in the industry, the Epson represents a good buy from an established and well respected firm.

For additional information,contact: Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. ●

**A★Star**
**continued from page 136**

tion I/O adapter.

I like the A★Star. If I were buying a computer now it would be this offering from Wells. There is a lot offered by the A★Star as far as what comes with the original purchase and the add-ons that you look for later on. I would find it hard to believe that you could outgrow the A★Star any time in the near future. With the 4 operating speeds to use the user can save valuable time that would otherwise be spent waiting for the computer to catch up. If a particular piece of software is speed sensitive you can always change gears and drop down a speed. I have never been impressed by big price tags or names but a small price tag doesn't do you any good if the equipment is inferior, or skimps on what is inside the case. A★Star has a reasonable price with a lot to offer in quality and the total system.

Service was the one big question in my mind as I went through the A★Star. Wells is offering extended service agreements and on site maintenance in selected areas. I had one of my service technician friends look at the unit and he assured me that local service should not be a problem. Any trained tech that can service a PC can handle service on the A★Star. The fact that you can get schematics with the purchase is a definite plus. For all practical purposes you can dismiss service as being no problem.

The A★Star is available in three basic models. The 100 with 512K and a 1.2MB disk drive ($1495). The 200 ($1995) that is the same as the 100 except that it also contains a 20Meg hard drive and a 512K memory expansion, and the 300 ($2395).

For more info contact Wells American, 3243 Sunset Boulevard, West Colombia, SC 29169. 803-796-7800. ●


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| Sprint 9/55 | 55 CPS RS232 Serial | $695.00 |
| *Sprint 11/55 | 55 CPS Centronics Parallel or RS232 Serial | $895.00 |

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This program runs on IBM, IBM compatibles and most other MS-DOS machines.

Minimum hardware requirements: 128K RAM, 2 floppies or fixed disk, 80 column printer, MS-DOS, PC-DOS 2.0 or later.

# Remote—Using A Specialized Communications Program

by Brian K. Lewis

Have you ever taken a number of diskettes home from the office just so you can catch up on your work by using your home computer? If you have a hard disk machine in the office and a floppy drive machine at home, you soon notice the difference. The disk shuffling becomes tiresome, you never have the right disk in the right drive, and the disk accesses seem to take forever. Plus, what do you do about those files that take more space than will fit on one floppy disk? How would you like a relatively inexpensive way to work directly on that hard disk machine from your home? Of course, each computer must have a modem. But with the office computer running Remote from Microstuf, the producers of Crosstalk XVI, you can access any program from your home computer or a terminal connected to a modem. There are other possible uses for Remote, but this is certainly one of its interesting applications.

I found Remote to be a simple package to install and configure for operation on a system which used a Zenith Z150 PC as the remote computer and a Leading Edge model M as the host machine running the Remote software. The internal modems I used were both from Everex, one a new EV-920 half-size card and the other an older full length model 1200B. Setting up Remote on the LE-PC involved copying the programs on the system disk to a newly established directory on drive C. This is a very straight foreword process as Remote is not copy protected.

The next step was to set up the master password, which is used to obtain entry to the user list and the user passwords. Remote asks you for a four digit numeric master password the first time you select the password file on the menu (See Figure 1). Then it shows you the user screen which includes the user name, his/her password, the terminal type and any desired autostart commands. Microstuf includes 31 different terminals that you can select from for each user. A standard terminal configuration can also be selected from this list. For most PC users either the VT100 or Crosstalk XVI would be a likely terminal choice, dependent of course, on the communications software you are running on the calling computer. In my case it was Crosstalk XVI or Bitcom, both of which include VT100 emulation. I wanted to try QModem, but it won't work from a computer using the COM3 serial port for the modem (more about this later.)

In most situations you won't need to change the default program settings. However, at this point, if you aren't familiar with communication parameters, you'll need to read your modem manual and carefully check all of the settings against the listing in Remote's manual. Changing these settings in Remote is quite simple. On the system setup menu (See Figure 2) simply select the high-lighted letter of the item you wish to change. Remote then provides you with a screen which allows you to type in the new entry. The documentation includes a copy of the screen with the instructions on how to make these changes.

Remote is also designed to handle baud rates of 300, 1200, 2400, 4800 or 9600. If your modem can automatically switch to the rate of the calling modem, there is an auto

continued on page 146


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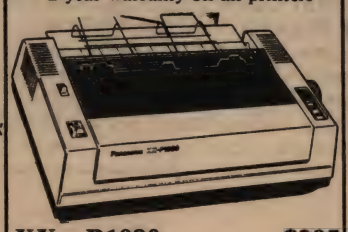

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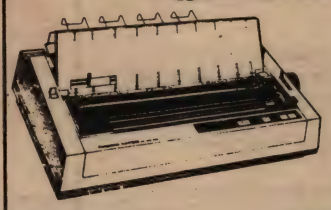
- IBM Graphics and Epson compatible
- 5 Switch selectable print modes

**Suggested retail: $599**



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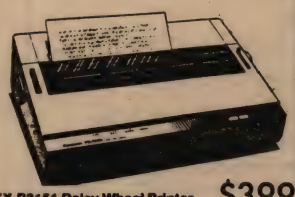

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**Review: Computer Shopper Page 77, September, 1986**

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# Farewell Gutenburg! Publish Your Book On A Disk

by Hal Nieburg

The cheapest and fastest form of publishing is electronic. Expensive hard copy books are on the way out, a great beneficence that will save the pine trees of the world. Today, it is possible to circulate manuscripts on disks the way printed books have been circulated for 300 years. Gutenburg is about to be surpassed! And all will be the beneficiaries.

A book on a disk is not unlike the self-teaching programs already available to teach software. A large follow-on support market has developed for tutorial materials, along with the older teaching-machine programs. And some of the major text book publishers, among them Prentice-Hall and McGraw-Hill, have moved into the field.

Before the Big Boys take over disk publishing too, it is time for unpublished authors to move into the void.

Publishing your own Book-on-a-Disk is not a mysterious enterprise. It is my purpose here to tell you exactly how to do it. Just saving your chapters to disk is not enough. What is needed is some rudimentary programming that makes the disk self-activating and interactive. With very minor programming ability, using mainly DOS utilities and BATCH files, any author can create his/her own book on a disk. For somewhat fancier presentations, there is a variety of easily-accessible public domain software that can be put to use.

### Place Of The Little Magazine

The dependence on capital-intensive publishing companies, warehouses, distribution channels is destined to disappear. High Tech self-publishing is not only becoming practical, but indeed is better in every way than the old 19th century ways of publishing.

In place of centralization, we will have decentralization. In place of large size, impersonal corporations, we will have a return to the human scale. Instead of faceless and remote gatekeepers who become the power brokers of what America may read, any person may offer his work to any taker, whether the market be broad or narrow, many or a few, with no cold-eyed middlemen.

As every author knows, old fashioned publishing is dying a natural death. The total number of books and companies decreases every year. In order to be profitible, books must appeal to the broadest audiences possible. That means that most publishers cannot afford to take a chance on anything except clones of proven blockbusters. The result is that books are published that imitate each other. A commercial book is a product designed with the same expensive care and market-testing as next year's Detroit models.

The most important and seminal works being written have yet to find audiences, therefore they are the hardest to publish. The kind of innovative, ground-breaking works, destined to change the way we all regard the world, are unlikely, given the economics of present publishing, ever to see the light of day.

Disk publishing can take the place of the Little Magazines! Writing can become once again a cottage industry, yet able to address national and global audiences, more immediately and personally than has ever been possible before. In recent decades, we have seen something of this in self-publication by mimeograph, what might be called the *Samizdaty*, the Russian literary underground that circulates forbidden works.

Mimeograph is gone, banished by the electrostatic copier. But even Xerox is awkward and unnecessary, compared with magnetic media. The disk, now selling for less than a dollar, allowing hundreds of pages of manuscript to be copied, anywhere, letter-perfect in minutes, mailable with a single 22 cent stamp, almost indestructable, is infinitely better.

Marshall McLuhan's "Global Village" can be seen coming to

continued on page 147


MASTER*KEY
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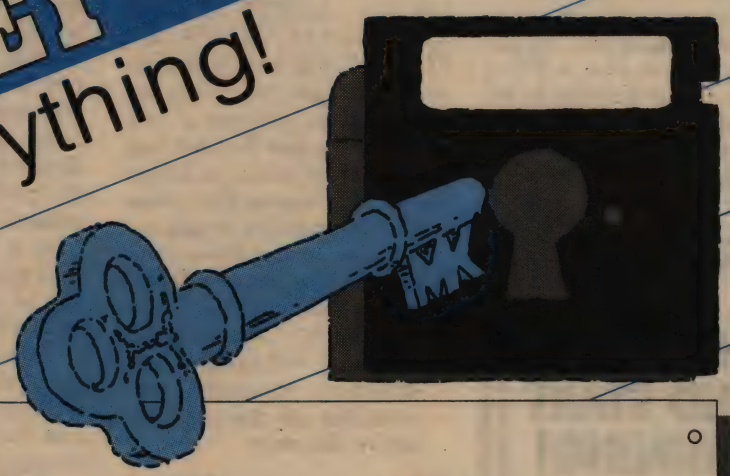

```
A>DEBUG
-N PROGRAM.COM
-L
-D 100 129
33CB:0100  EB 0B 40 05 56 65 72 73-20 31 2E 38 31 50 B4 30   k.@.Vers 1.81P40
33CB:0110  CD 21 86 E0 3D 36 01 72-05 3D 0A 02 76 09 BA CB   M!.`=6.r.=..v.:K
33CB:0120  03 B4 09 CD 21 CD 20 58-EB 2F                     .4.M!M Xk/
```

turn this:
into this

Instantly and automatically with a turn of MASTER-KEY!

Without MASTER*KEY, how long do you think it would take to find out this program wasn't running because you had the wrong version of DOS?

```
OFST  ASCII  OBJCODE     SRCECODE
                         ;Program:  PROGRAM.COM
0100         EB0B        H0100:  JMP    H010D
                         ;-----------------------------------------
0102         40                  INC    AX              ;NON-BRANCHED CODE
0103   Ve    055665              ADD    AX,6556h
0106   rs    7273                JB     H017B  ;. . . . . . . . . . . . . .
0108   1     2031                AND    [BX+DI],DH
010A   .     2E                  DB     2Eh
010B   81    3831                CMP    [BX+DI],DH
                         ;-----------------------------------------
010D   P     50          H010D:  PUSH   AX
010E   0     B430                MOV    AH,30h
0110   !     CD21                INT    21h             ;get DOS Version#
0112         86E0                XCHG   AL,AH
0114   =6    3D3601              CMP    AX,0136h
0117   r     7205                JB     H011E  ;. . . . . . . . . . . . . .
0119   =     3D0A02              CMP    AX,020Ah
011C   v     7609                JBE    H0127  ;. . . . . . . . . . . . . .
011E         BACB03      H011E:  MOV    DX,03CBh
0121         B409                MOV    AH,09h
0123   !     CD21                INT    21h             ;display string, DX
0125         CD20                INT    20h             ;terminate normally
                         ;-----------------------------------------
0127   X     58          H0127:  POP    AX
0128   /     EB2F                JMP    H0159
                         ;-----------------------------------------
```

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MASTER-KEY is an intelligent MS-DOS Disassembler. It produces easily readable self-documented assembly language segmented source files that can be edited with any ASCII file text editor or Word Processor then re-assembled using MS-DOS Debug, Assembler, or Macro Assembler and linked with other object modules if desired. It handles object code from the 8088, 8086, 8087, 80186, 80286, and 80287 processors. It decodes into MS-DOS 2.0, 2.1, 3.0, and 3.1 from BOTH COM and EXE files.

MASTER-KEY includes a Source Code Formatter and Cross-Reference Generator. The Formatter produces a documented source listing identifying all ROM BIOS and DOS Functions and Interrupts. It serves as an object code optimizer by helping to identify stack areas, temporary storage, ASCII strings, and unnecessary code. The Cross-Reference identifies the number and location of all labels, symbols, functions, and interrupts.

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# Configuring Your Hard Disk

by Ronny Richardson

Hard disk prices have come down so much that almost everyone either owns one or is considering buying one. Installing a hard disk means that file management changes from filing floppy diskettes to managing files on the hard disk. Major decisions must be made as soon as the hard disk is installed, often before you have a lot of experience with hard disks. This article will aid you in making those decisions.

Consider that a floppy diskette is like a desk, because you can just toss all your papers on a desk and still find what you need. A hard disk, on the other hand, is like a filing cabinet, if you just toss in all your papers, it is unlikely you will ever find anything. Just as you categorize all the papers in a filing cabinet into files, you categorize the files on a hard disk into subdirectories. A subdirectory is a logical subdivision of a disk, much as a folder is a logical division of a filing cabinet. The disk operating system (DOS) treats each subdirectory much like a separate diskette. Each subdirectory can grow to fill all the available space on the hard disk. So using subdirectories does not make it more difficult to "fit" files on a hard disk.

The DOS commands for managing subdirectories are MD, RD, CD, CHDIR, MKDIR, RMDIR, FDISK, and FORMAT. (FDISK and FORMAT will both completely erase a hard disk. They are only used to prepare a new hard disk or one that has had a major crash and is no longer usable. The manual that comes with the hard disk should explain how to use these commands.) These commands perform the following functions:

MD <name> (or MKDIR <name>) will make a subdirectory <name> that branches off the currently active directory.

RD <name> (or RMDIR <name>) will remove the subdirectory <name> if it branches off the current directory and if it does not contain any files.

CD <path> (or CHDIR <path>) will change the currently active directory to the one named in <path>.

The subdirectories of a disk can be thought of as a tree. Each disk has only one root (or base) directory. This is normally the only directory of a floppy diskette. It is created automatically by formatting. The root directory can have as many subdirectories as desired. Each of these subdirectories can have subdirectories, and so on. The limit is that C:\SUBDIRECTORY1\SUBDIRDIRECTORY2\etc must be less than sixty-three characters long. When a directory is created, it will be a child (or branch) of the current directory (called the parent). So if you create a subdirectory while in the root directory, that subdirectory will be a branch of the root directory. If it were created while in a subdirectory, it would be a branch of that subdirectory. So a drawing of all the subdirectories looks a lot like an inverted tree.

To remove a directory, that directory must not have any files except the required dot and double dot files. (The root directory will not have a dot or double dot file. The root directory can not be removed.) If you find you can not remove a subdirectory, first check to see if it has any files in it. If so, they must be erased. When the DIR command does not show any files, you most likely have hidden files. These are usually created by a copy protected program. They can be removed by the software that created them or by using the Norton Utilities. Improper removal will render the copy protected software permanently useless.

In changing directories, you can only move along a continuous path. If the root directory has two subdirectories named one and two, you can not move directly from subdirectory one to subdirectory two. You must move from subdirectory one to the root directory and then to subdirectory two. CD\always returns you to the root directory.

Typically, the first level of subdirectories are functional. There is one for system files, one for word processing, one for spreadsheets, and so on. Each of the subdirectories can have subdirectories. So the word processing subdirectory could have subdirectories for personal letters, course outlines, tests, consulting, and so on. If you teach several courses, the test subdirectory could even be subdivided by course. At some point, further division becomes more trouble than it is worth.

The root directory will only have a few files in it. The operating system requires it to have COMMAND.COM and two hidden files. If you plan to use an AUTOEXEC.BAT file or a CONFIG.SYS file, they must be in the root directory. Since each directory should be for a single purpose and the root directory is the directory for booting the computer, I recommend not having any other files in the root directory.

The AUTOEXEC.BAT file is a batch file that the computer automatically executes whenever it is turned on or rebooted. Any batch file is nothing more than a series of DOS commands. The batch file simply keeps you from having to enter them every time you want to use them. The AUTOEXEC.BAT file typically has several functions:

- Setting the sytem date and time. If an AUTOEXEC.BAT file is used, DOS does not automatically prompt for the date and time. The AUTOEXEC.BAT file can set the date and time either by reading a clock if you have one (see the clock manual) or by using the DATE and TIME DOS commands.
- Set the path. When you issue a command, it must either be:

1. A built-in DOS command, such as DIR or DATE.
2. The name of a program. Programs will end with either .COM or .EXE.

continued on page 150


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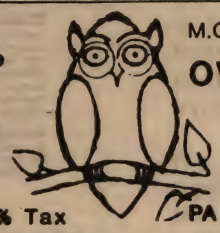

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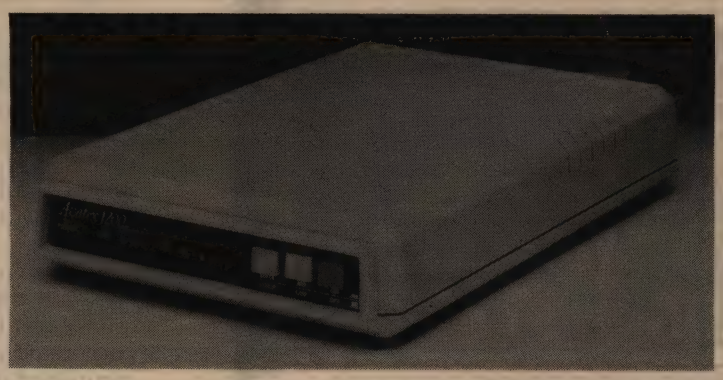

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**Remote**
**continued from page 142**

setting available in the menu. Having completed these steps, you are ready to switch to the calling (See Figure 3), turn off the monitor and go home (or to your other terminal).

At your second computer, or terminal, call the host computer. After the connection is made, Remote will log on and ask you for the password. Once you have transmitted your password. Remote passes out of the picture and it then seems like you are seated at the keyboard of the host. In some programs, there may be a noticeable slowing of the screen response due to the 1200 baud transmission speed. In other cases, the speed difference is negligible. I was able to run any program I wished without any interference from Remote or any feeling that I was being delayed.

The only program I used that created a problem was the directory-file manager, 1DIR which writes directly to the video screen. Remote allows for this by allowing you to transmit a screen image following an ESC- command from the calling computer. However, screen updates are transmitted only when a change occurs on the screen of the host computer. This does slow down the overall operation. I found it easier to remove 1DIR from memory and operate strictly from the C prompt. I did not try to run any copy protected programs which require a key disk in Drive A. For one reason, I don't use software that is copy-protected and for a second, Remote re-boots the computer after the user logs off. The key disk routine introduces a complication into the process and may block the re-running of Remote. I would not recommend using Remote under such conditions, especially if you will have multiple users calling in. There were no other hitches that I found in the software operation.

Remote also offers a mail read/write capability with the mail being directed to a specific person or persons who are included on the Remote users list. Others will be unable to read the mail files. In addition, you can specify the persons, to whom the document is to go, then type in, or transmit one copy of the document. Remote handles the rest of the distribution problem. You can also upload and download files, which is especially easy if the caller is running Crosstalk. [There is an obvious family resemblance as well as a specific design for interaction between Remote and Crosstalk.] The mail system is well thought out and could be your major reason for purchasing Remote.

Another feature of Remote's password file allows you to include an autostart command for all or some individuals. This can direct them to a specific program, or it can call their mailbox. This feature might be useful for salespeople or others working at distant locations.

There were a couple of things that would have made my life easier if they had been incorporated into Remote. As I mentioned one of the computers in this test system is a Zenith Z150. This machine is factory equipped with two COM ports and as far as I can determine, neither one can be disabled without a ROM change on the disk controller board. So if you use an internal modem, it must be configured for something other than three two ports. The Everex modems can be configured for any one of four ports, COM1 thru COM4. Both Crosstalk XVI and BIT-COM (ver 2.3 and later) can also address these additional ports. COM3 or COM 4 can then be used for communication ports and I have done so quite successfully on both the Zenith and the Leading Edge. But Remote does not have the ability to accept any port assignment other than COM1 or COM2. I agree that this is not absolutely necessary in a PC/MS-DOS world where only two ports are supported, but it certainly would be useful for some of us. I have noted comments from other Zenith owners of BIX (Byte Information Exchange) related to this problem. Because of the two factory installed COM ports on the early Zeniths, problems have occurred when users attempted to operate internal modems which support only

**continued on page 148**


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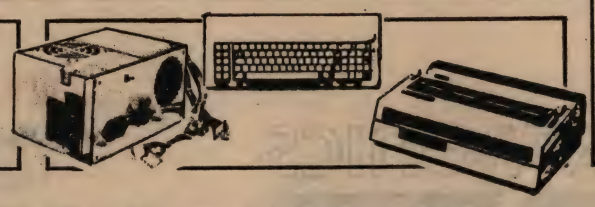

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**Farewell Gutenburg! continued from page 143**

pass in the phenomenon of desk-top publishing. But surely the print-on-paper phase is only temporary. The time is close at hand where all distribution will be electronic, available from infinite data banks directly to home micros. But between that stage and the present, there is now a place for disk publishing!

Computers are getting as ubiquitous as urinals. This is true, especially on college campuses. It will soon be true in public libraries, in all business places, in Christian Science Reading Rooms, bus stations, airports, and someday soon, in homes. As Taiwanese entrepreneurs in back rooms turn out advanced PCs and the price falls below $500, which it will do any day now, good quality, highly versatile, and powerful machines will be as omnipresent as pocket calculators are today.

Books on disks can already reach a large part of the potential audience of specialized book readers, most of whom have access to micros. But that number will continue to grow by leaps and bounds, especially as the new uses (such as books on disks) are realized.

I was led to publish on disk as the easiest way to provide new learning materials to college students. My university, like most everywhere, has been buying PCs in numbers even though most have yet to figure out pedegogical uses. Textbooks on a disk have the bonus effect of giving students a chance to use the micros. Curiously, there appears to be stronger incentives to go to a computer lab than to a library. Increasingly, the micros are being dispersed around the campus, so that micro labs themselves appear to be transitional phenomena. In the future, we need to see PCs, like softdrink machines, in lounges, dining halls, recreational rooms, laundry rooms, wherever there are students.

I am able to sell students the textbook disks for the price of the disk alone, about $1 for about 300 pages of text. A real bargain! In addition, I can get out new materials with less than a week of leadtime, less than the time required to turn out Xeroxed syllabi and readings on paper. Combined with a text scanner, loading text directly into the computer without a typist, I can publish a new textbook, readings, lecture materials on short notice anytime in the semester there is a need.

But let us get down to business. How to do it?

### Structural Components

A single IBM-compatible disk holds 362K bytes. Allowing for formatting, self-booting system tracks, and the interactive software, leaves about 300K bytes for text files. In the example I will cite here, there are six chapters or articles of about 40K bytes average length each. Printed out in double space format, each is equivalent to about 32 pages of text. (I recommend that students print out hard copies single spaced to save paper.)

In addition to the body of contents, I will need an introduction and table of contents. This must not only introduce the readings, as in an ordinary book, but must also explain how to access the readings, how to use the computer as a note-taking system, and how, if desired, to print out entire chapters. Self-accessing indexes (some sort of SEARCH utility) can also be implemented and explained to the user.

### Text Must Be In ASCII

Structural components will be created in two forms: text and batch files. Text can be written exactly as is done with the chapters themselves, that is, with a favorite text editor or word processor. In order to run the interactive program, it will be necessary that all text files be in ASCII form, the basic character set provided for the PC, without special formatting commands or high order symbols embedded in the text. Line-length and paragraphing should be arranged in attractive and manageable form, with titles, headings and subheadings in place.

What-you-see-is-what-you-get is especially pertinent to disk publishing, since this is the form in which the product is to be consumed.

All text editors create simple ASCII screens, but many word processor implement special formatting symbols. These must be removed or circumvented to prepare text for disk presentation. Fortunately, most recent word processors allow the option of saving files in either their own or other formats, including ASCII. WordStar, for example, allows users to save files in NON-Document mode. PSF-WRITE converts to ASCII by saving with the file extension ASC. Others, such as Framework, permit "export" of files into other formats.

Andy Fried of *Computer Shopper's* staff has written a program called "Quick Clean" that converts a WordStar document file to ASCII. To obtain a copy send a check for $7.00 to: Quick Copy, Andy Fried, 895 Cynthia Drive, Titusville, FL 32780.

Text files can be read to the screen by at least five methods:

1.) Using the ECHO command in batch files. This works more slowly than is desirable, and constricts line size, thus can only be used for short messages. It is also more awkward to set up the text. BATCH files themselves can be written by the use of COPY CON command (that is, copy from consol to disk file). This is the mode recommended and illustrated below. It is also possible to write BATCH files with EDLIN.COM, the DOS line editor, or with any text editor. See your DOS manual for these.

2.) Using the TYPE command. This is fast, but requires that it be repeated over with each 24 lines of text, separated by PAUSE commands ("Hit any key to continue."). Otherwise it will scroll off the screen too quickly.

3.) Using standard DOS utility MORE.COM. This is fast, takes only 295 bytes on the disk, is controlled by the reader, automatically paginates the

**continued on page 152**


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Remote continued from page 146

Figure 1. Main Menu for Remote

Figure 2. System Setup Menu

COM1 and COM2. Isn't it interesting how many diferent forms the compatibility problem takes?

The only other problem was related to the modems that I used in this system. Remote requires that the modem have its auto-answer function enabled outside of the program. This is linked to their compatibility with the Hayes modem which uses a DIP switch to enable the auto answer function. This was also a hardware switch change on the older Everex modem, but the newer EV-920 requires a software command to activate the auto-answer function. Once I figured out how to send the software command to the modem, I then turned on Remote and everything worked fine. However, when the caller hangs up, Remote reboots the computer and my temporary auto-answer setup was lost. So in a system like this, you would have to call a program from your autoexec file which would reset the modem on auto-answer. And, if should leave the modem on during the initial loading of Remote. It would be an asset if Remote allowed you to include an initialization string in the configuration file which would reset the auto-answer after every reboot. Or, if Remote sent the Haye's compatible AISO command to the modem after each reset. The documentation indiates that Remote tests the modem on every reset and sends an initialization string, but this does not set the modem to auto-answer. I have been unable to determine just what that string is, or if it can be modified. Like many other companies these days, Microstuf's customer support lines are exceedingly busy and it is difficult, if not impossible, to get through.

You can also change the number of rings which are required to occur before the modem will answer. This function worked quite well with the older model Everex modem. But, it didn't work at all with the new EV-920 model. Everex told me they hadn't tested their modem with Remote, so they didn't know if there was a possible compatibility problem.

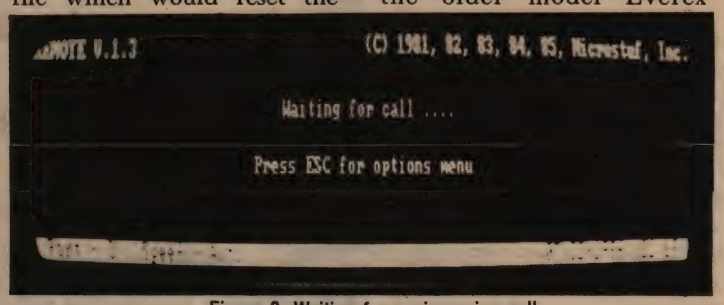


Figure 3. Waiting for an incoming call.

These comments should in no way detract from the ability of the software to carryout the job it promises. Most users will not have the COM port problems I have experienced. But, the auto-answer problem may occur more frequently, depending on the modem you have installed. If you are considering installing this system and you don't have a modem, insist on one which uses a hardware switch to enable the auto-answer function. And, if possible, test Remote with the hardware configuration you want to use.

Overall, Remote is a program which delivers a useful product with clear and easy to use instructions. When you consider that this program is available by mail order for under $100, if you have a need for remote communications and have compatible hardware, it is a bargain.

Remote is available from:
Microstuf, Inc.
1000 Holcomb Woods Pkwy
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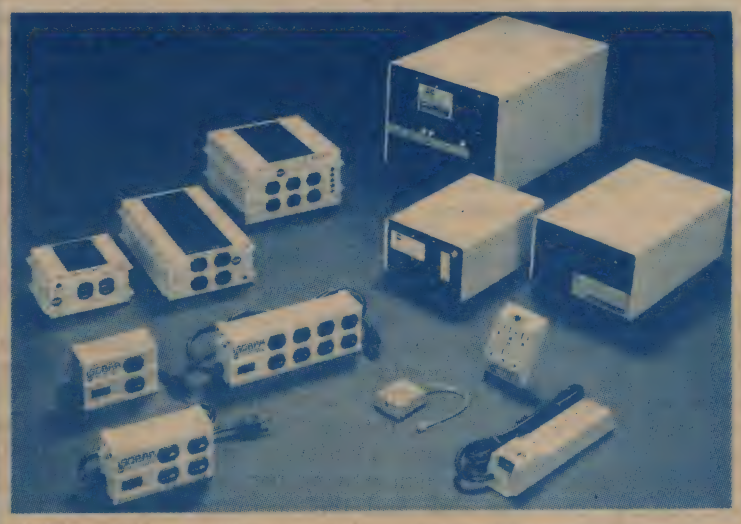

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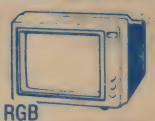

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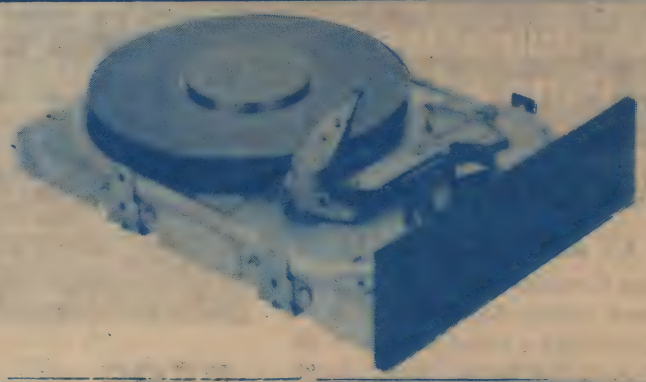

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**Configuring Your Disk**
**continued from page 144**

3. The name of a batch file to run. These must end with .BAT.

If you issue a command that is not a built-in DOS command and it is not in the current directory, DOS will search all subdirectories listed in the PATH command. The format is:

PATH = C:\;\DIRECTORY-1;\DIRECTORY2;\AND SO ON

- Changing the prompt. The normal DOS prompt is a useless C>. This can be changed to display the active subdirectory by the following line in the AUTOEXEC.BAT file:

PROMPT = $P$G

- Start any memory resident program that you want to use all the time. See the program directions for the commands to include in the AUTOEXEC.BAT. The commands to start Sidekick, assuming it is in a directory called SK are:

CD\ Move to root directory to always start from a known position.

CD SK Move to SK directory. Sidekick requires the computer to be in its directory when Sidekick is started. These two commands could be combined into CD\SK.

SK The command to start Sidekick.

The problem with most memory resident programs is they are picky about how they are loaded. Some want to be loaded first and some last. If you have three memory resident programs from three different vendors, all expecting to be loaded last, you have a problem. In general, you have to keep trying all possible combinations until one works. By then storing that combination in an AUTOEXEC.BAT file, you do not have to remember it or worry about losing data by loading the memory resident programs in the wrong order.

The CONFIG.SYS file is a special file. DOS reads it only when the machine is turned on or rebooted. It gives DOS directions on how to configure memory. The available commands are:

- **BREAK = ON/OFF.** The default is off. Setting this switch on can make it easier to stop a "run-away" program. I recommend the ON setting.
- **BUFFERS = xx,** where xx is a number between zero and ninety nine. A buffer is used to buffer data moving between the disk and the operating system. Each buffer requires 528 bytes. If you are cramped for memory, use twenty. Otherwise, use ninety nine.
- **FILES = xx,** where xx is a number between five and ninety nine. Since DOS can only open twenty files at once, just set the number to twenty. Many data base programs will require a FILES = 20.
- **DEVICE = ____.** This is a way of adding device drivers to DOS itself. This is often used for a mouse, some extra memory boards, and some hard disks. Any device requiring this should have the proper syntax in the manual.

One of the subdirectories will have the DOS programs. This directory will contain all of the operating system commands, such as CHKDSK and FORMAT. This directory must be in the path so these programs can be executed anytime.

One advantage of a hard disk is the ability to use menus. This makes it possible to run applications just by selecting the appropriate menu selection. Menus can also be used to control how dangerous programs are used. For example, FORMATting a disk without the drive [FORMAT A:] can erase the entire hard disk with some versions of DOS. This can be avoided by using a menu.

To do this, rename FORMAT.COM to a name unlikely to be used, such as ZYZ.COM. Then use a batch file like:

```
ECHO OFF
XYZ% 1 A:
MENU
ECHO ON
```

to format the disk. The %1 is a batch file replaceable parameter. It allows the user to include slash options, such as /v and /s, in the formatting. The echo off prevents the user from seeing the name of the formatting program.

A menu is nothing more than a list of options on the screen. There are several ways to get the text on the screen. The menu can be stored in an ASCII file and TYPEd to the screen using the DOS TYPE command. Another way is to write a program to display the menu using a high level language such as BASIC or Pascal. Figure 1 shows the code for a typical menu in BASIC. The program could be compiled. The menu gives numbers for each option. The user types in the number for the program to run and presses return. That runs a batch file with that number. For example option 10 could be to format a disk in the A drive. The above formatting batch file could be named 10.BAT. An additional command would be added at the bottom of the file to redisplay the menu. If the menu was an ASCII file, you would add:

```
CD\
TYPE MENU.TXT
```

There are several ways to build the actual batch files. The easiest is with the DOS command COPY CON:FILENAME.BAT. This causes all the keystrokes you type to be recorded in the filename.bat specified above. You stop recording by pressing the F6 function key followed by a return. The disadvantage of this method is that you must retype each file to make minor corrections. Other ways to create batch files are with the DOS EDLIN editor or with any word processor that can create ASCII files. Typically, all the batch files are collected in a batch subdirectory. This subdirectory must be in the path.

A DOS program that is very useful with a hard disk is the CHKDSK (CHecKDiSK) program. You run this program every so often to test the hard disk and to correct minor problems. CHKDSK reports the amount of disk space, the amount of disk space allocated to hidden and regular files, the amount of disk space with problems, the remaining disk space and the amount of system memory. If CHKDSK is started with the /F option, it will "fix" some problems. I recommend that CHKDSK be run at least once a week. I have it as part of my AUTOEX-

**continued on page 153**

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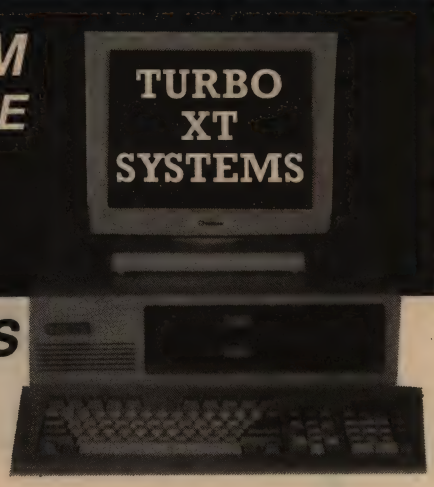


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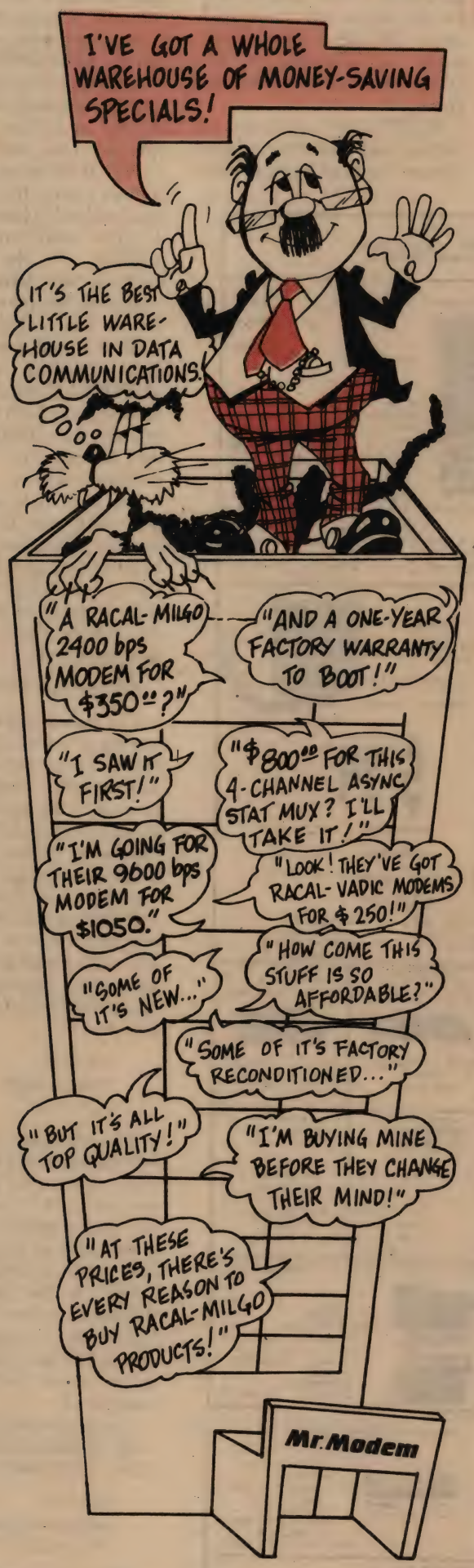


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**Farewell Gutenburg! continued from page 147**

text, and returns the screen to a DOS prompt at the end. This is useful and can be used for all kinds of text, both instructions and book chapters. However, it permits turning pages forward but not back, and has no indexing or search capability.

4.) Fortunately, there are a number of public domain utilities readily available which have great advantages over MORE. These include BROWSE.COM, SCROLL.COM, and K2.COM, which can be had on any electronic bulletin board or from collections of any software interest group. This also takes up little disk space (BROWSE.COM is 1520 bytes), read to screen quickly, allows users to flip pages back and forth, and have simple built-in SEARCH routines. While other methods work well for messages or instructions, I prefer one of these for projecting the articles or chapters themselves on the monitor.

5.) A text editor or word processor may be used for reading purposes as well. Freeware or public domain does provide some excellent resources here, such as PCWRITE. Such use gives the book user more options for windowing, note-taking, editing, navigating around the text. But, the program itself takes up too much space on the disk, and the likelihood is high that the text will be jumbled, or the software locked-up after extensive use. One can do without the additional task of training the user in another program.

### The AUTOEXEC.BAT File

In the example developed here, we will stick with BROWSE.COM and TYPE for the whole job; but please note, MORE.COM, which every user possesses on the DOS disk, would be almost as good.

PC/MS-DOS provides a built-in self-executing bootup routine, that can be tailored to perform any operations at bootup without the intervention of awareness of the user. This is called the AUTOEXEC.BAT file. At bootup, the hidden system files are fed into memory, then the COMMAND.COM file is read. It contains, among other things, an instruction to look for and run the AUTOEXEC file. Any commands found there will be run consecutively from DOS, exactly as if the user were entering them one at a time.

The Book-on-a-Disk must contain such a file. Thus, the user need only place the disk in A drive and turn on the machine. As the computer boots, it will describe to the user all of the options available at any time. Whatever program material executes, control remains with the AUTOEXEC batch file until all lines have been run. In this manner, the file can be used as the director for the entire reading session.

We will write all BATCH files with the COPY CON routine. How does this work? Make sure your disk is not full and go to a DOS prompt on the default drive (that is, where the disk is). Press Enter key after each entry:

```
A>copy con autoexec.bat
```

The cursor will move to the left margin of the next line and blink. Enter each command just as you would at the prompt, with an Enter stroke ending each line. After the last line, hit the F6 key (or Control-Z, the same thing), followed by the Enter key. The disk drive will light up and the entire file will be written to the disk. If you make a mistake, do it over again from the beginning. The finished AUTOEXEC file looks like this:

```
echo off
browse intro.mss
type a.txt
```

To translate—"echo off" tells the computer to "echo" the commands to the screen while executing; "browse" loads the text display utility; "intro.mss" is the name of the instructions and table of contents files; "type" is the quick screen display of a short text; and a "a.txt" is a standard menu which tells the user his options after each operation is completed.

You may wish to experiment with MORE.COM in place of either BROWSE or TYPE:

```
echo off
more<intro.mss
more<a.txt
```

The initial instructions are contained in the INTRO.MSS file. Suitably arranged on the screen, it reads as follows:

**continued on page 156**


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**Configuring Your Disk continued from page 150**

EC.BAT file so it is run each time the computer is turned on, however, this increases the time it takes the computer to start.

One of the reports CHKDSK provides is the number of hidden files. Two DOS hidden files are created if the disk is formatted as a system disk. Another DOS hidden file is created if the disk if formatted with the /V option to enter a volume label. In addition, some copy protected software packages create hidden files when they are installed on a hard disk.

One common problem with hard disks is lost clusters. DOS maintains a map of the location of each file. This map is called the File Allocation Table (FAT). A lost cluster is when the sections of a file (clusters) do not agree with this table. One way to create a lost cluster is to stop a program while it is writing to the disk. Lost clusters result because most programs do not update the FAT until after the file is created. Stopping the program in the middle creates the file but does not update the FAT. Lost clusters is the major hard disk problem that is located (and corrected with the /F option) by the CHKDSK program. CHKDSK stores each section of lost clusters in files in the root directory with names like FILE0000.CHK. You can look at these and decide if you need to keep them or erase them.

The single biggest problem with hard disks is making backups. If you lose the contents of a single floppy disk, it is not likely to cause major problems. However, losing the contents of an entire hard disk can be devastating. There are several ways to make backup copies of a hard disk. You can buy a machine to record the contents of the hard disk onto a small tape. These usually cost more than the hard disk. You can buy a second hard disk. You can buy a backup utility to copy the contents of the hard disk onto floppies or you can use the DOS BACKUP command to do the same. The DOS BACKUP command is much slower than most commercial utilities. Its major asset is that it comes at no additional cost with your DOS disk.

BACKUP copies the hard disk files onto a series of formatted floppy disks. Large files will occupy more than one floppy. Unlike COPY, BACKUP will split files between floppies to make sure that all of each floppy is used. The resulting files are not usable and can only be RESTOREd to another hard disk. If your hard disk breaks and you must work from floppies, BACKUP files will be useless.

BACKUP has two major modes. BACKUP/S will backup all the files on the hard disk to floppies. Doing this at least once a month provides a full backup of the hard disk. Between full backups, BACKUP/S/M will backup only those files that have been changed, this is called an incremental backup. This greatly speeds up BACKUP by skipping over files (like program files) that do not change. There are several minor problems with this method. Files that are erased between full backups will not be erased if you must RESTORE the hard disk. Files that are renamed between full backups will be RESTORED under both names. Anytime you make major changes to the hard disk you should do a complete backup.

You can resolve these minor problems using the following batch file:

```
CD\
DIRSORT EN/S
FILEFIND*.* > C:\BAT\
LISTING.TXT
```

The first line goes to the root directory. The second line is optional. It sorts all the directories in extension order with filename as the tie breaker. DIRSORT is one of the programs that come with the Norton Utilities. Other sorting orders can be used. The third lines uses another Norton Utilities program to find all files (*.*) on the hard disk. The DOS piping command (>) is used to pipe the output to the file C:\BAT\-LISTING.TXT, or any other filename you choose. If the file does not exist, it will be created automatically. If it does exist, it will be erased. If yo do not have the Norton Utilities, you can replace the last line with:

```
CHKDSK\V > C:\BAT\
LISTING.TXT
```

All this batch file does is create a file containing a list of all the files on the hard disk. By running it before backing up, this file will also be backed up—even by an incremental backup. If you must RESTORE, you can compare the files that exist after the RESTORE to LISTING.TXT. Any files that exist on the hard disk but not in LISTING.TXT were either erased or renamed,

**continued on page 158**


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# DOSPOP: Another Memory-Resident Utility

by Michael W. Ecker

The concept of memory-resident utilities has been with the PC world for just a couple of years now, yet most readers are familiar with the concept of pressing certain key combinations to activate a background program, usually by opening a window, doing an application, and then returning to the original foreground word processor, spreadsheet, database, or program. In the case of DOSPOP, the idea is to access file and disk operations from within your program.

Still, when Harry Haines of Haines & Associates announced its new RAM-resident utility, DOSPOP, I could not help but wonder what its claim to fame would be. After all, we have such time-honored programs as SideKick, Tornado Notes (see my review last issue), key macro programs, Popup DeskSet Plus, and you can probably add many more to the list.

The review copy I received, sent to the *Computer Shopper*, consisted of a simple package: non-copy-protected disk plus about ten pages of printout of the simple .DOC pages on the disk already, along with descriptive information in the form of a product release. I consider it a bad omen when I learn as much from a product release as I do from the documentation intended for the end user, and my impression has not been shaken by subsequent testing.

The three files on the disk include the 53K DOSPOP program, the brief documentation, and a file about compatibility/incompatibility with other programs, including RAM-resident ones such as Sidekick. I don't know whether or not the end user ordinarily gets just the disk or also the printed material, but in either case, there is nothing for novices to advise as to how to make backups, load the program, or any of the mechanics. Considering how basic this program is and that it costs $40, I am surprised by this in a mature market where fuller documentation could be expected. Perhaps most users today don't need to be advised about loading and such and will know automatically what to do anyway.

Not that I had any difficulty in testing DOSPOP on my Tandy 1000. In fact, I must confess that this is one of the easiest programs around to use, probably the only superlative I will use in this review. Just type DOSPOP from DOS Ready's A> prompt (or B> or C>, depending on which is the logged drive), and the program loads. You get a half dozen features which somehow manage to consume 53K of memory; I would have thought this could be accomplished in much less.

Once you have DOSPOP loaded, you invoke the choices by the ALT key plus an appropriate letter key. The choices of letter and their actions are: D—display date; T—display time; C—copy files, E—erase files; S—show files; P—set printer; and left shift—remove DOSPOP from memory.

The date function is cute, displaying the date in the upper right hand corner of the screen, with no real way to remove it unless your foreground application somehow allows some kind of screen clear. The time works similarly, and it is not dynamic, meaning the time just sits there without being updated. Surely, if you could not have a real timer, couldn't a timer have been installed to remove the time after one minute or so as the time becomes incorrect?

File copying does just what its name implies, as is the case with erasing, renaming, and showing files. Evidently, there is no way to format a disk, and this is a major criticism of the concept: it is incomplete. Of all things I would need to do, formatting a disk is number one. After all, if I need more disk space, I can just use a new disk, but if no disk is formatted, then I am forced to kill files, something I would prefer not to do.

The printer setting feature might seem nice in conjunction with other programs such as Tornado Notes or Sidekick where you want to print out a quick note but would like a nominal choice of typeface, at least. Unfortunately, the documentation makes clear that the controls are for Epson only. While I grant that Epson may still be number one, or big, in printer sales, there are several hundred printers on the market, and I found this feature limited at best. Worse, when I went ahead to test it just to see what would happen, I found that the window of choices, despite appearing okay, locked up, and I lost part of my work. I had to reboot as the sole solution.

DOSPOP's claim to fame would seem to be in the area of file and disk operations—as opposed to notes, calculators, dialers, ASCII tables, and similar features of other RAM-resident programs. In that regard, it might serve some function if it addressed the problems I raised here about formatting and printing. Even then, the program seems to have few of the features we would expect in 1986. In fact, many application programs such as word processors (Volkswriter, etc.) already have features to allow some of the file operations.

If DOSPOP were introduced for the first time in 1983, I might be able to summon up some more enthusiasm for it. But as the program stands, other than its ease of use, it has few features compared to what the present market of RAM-resident utilities and DOS shells offer, is not bug-free, clear, and complete, and is not a good value for the money. If this program were released to the public domain or sold for $10, it might be okay. But, at $40, I'd have to say sorry Charlie! Save your money for something better.

DOSPOP, $40 plus $2.50 Shipping/handling. Haines & Associates, Inc., 12000 Westheimer, Suite 214, Houston, TX 77077; (713) 493-3149. ●


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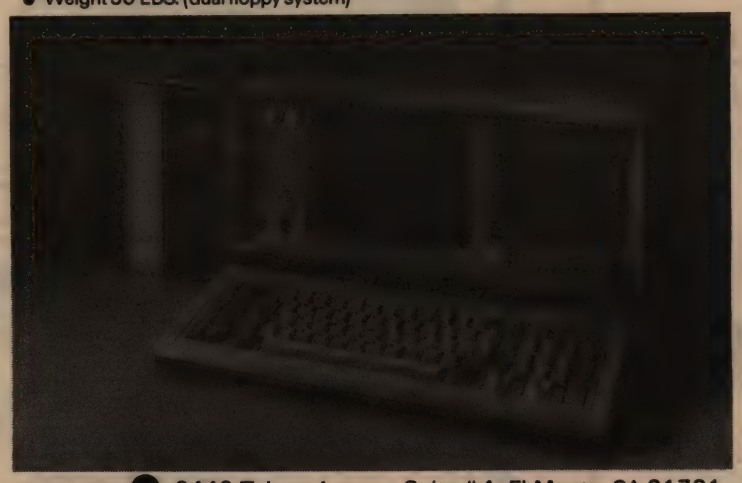

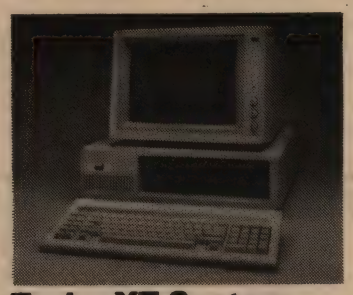

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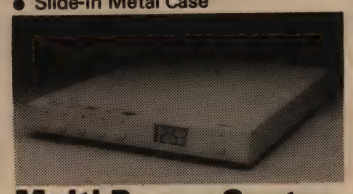

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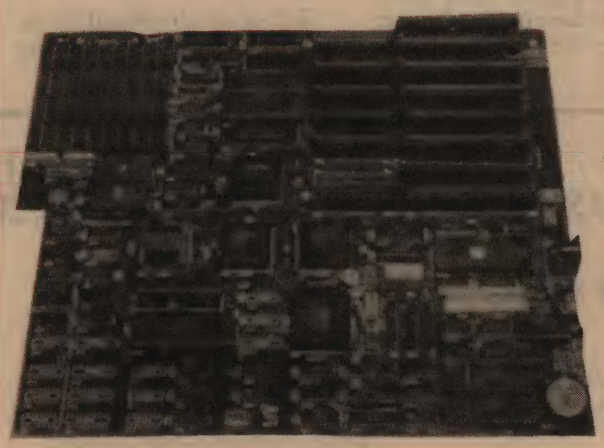

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**Farewell Gutenburg!**
**continued from page 152**

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**Welcome To Disk Readings For PS 133 Public Policy and the Media**

[Program arranged by H.L. Nieburg, 9/1/1986]

On this disk you will find six articles, a Table of Contents, and some software to enable the user to turn pages back and forth as desired, to find specific places in the text instantly, to print out reading notes as you go, or to print out an entire text as hard copy.

To move around in the text of any of the readings, use the PgUp and PgDn keys on the right of the keyboard. To turn to the next screen, one presses key "PgDn"—and to turn back one screen, "PgUp." In this manner, one can flip pages backward and forward through the text. Technically, this is called "scrolling" the text. Please try doing this now. Press PgDn and PgUp several times. Then return to this page of text.

One can go to the end of any article by pressing "End" and can return to the beginning with "Home." These keys are located in the group of cursor and number keys on the right of the keyboard. Try them if you like.

If you wish to exit, just press Escape. Before you try this command, better learn how to get back to where you are now.

This is how: Exit from this text, or from any text displayed on the screen, by hitting Escape. When this is done, the main menu will re-appear on the screen. You can bring up another reading or exit from the computer by selecting a number on the menu. Then hit the carriage return key, usually indicated in instruction routines this way:

<CR> or <– –

It is the gray key, vertically elongated, on the right, between the alphabetic letters and the number pad. It is marked with IBM's uniquely confusing crooked arrow.

IMPORTANT!!! Whenever you give a command at a prompt, you must hit the <CR> <– – afterward in order to punch the command into the computer.

There is an INSTANT SEARCH utility which will enable the reader to go directly to any designated part of any text. The procedure is as follows: Hit the / key. Note that two lines appear on the screen at bottom left. Cursor is blinking after the word SEARCH. Type in a key word located at place in the text you wish to go. Punch it in by hitting <CR>. Now each time you hit F10 the next occurrence of the keyword will appear at the top of the screen. Hit F10 until you arrive at the desired place in the text.

**Printing Out Entire Articles**

This can be accomplished very readily. Some of the IBM-PCs are connected to printers. These are rapid dot-matrix types which use a continuous scroll of paper which is already loaded. If your printer is out of paper, request more at the desk. If necessary seek the aid of the consultant in loading the paper.

Consult the Table of Contents and remember the code number of the article you desire. Turn on the printer. Then get a prompt on the screen. At the prompt, type in the number of the article, followed by the letter "p" with no spaces in between. Then hit the Enter key <– –. It should look like this:

A>3p <– –

This will print out the article on Dyslexia and Computers.

The article will print as a continuous scroll which can be folded up.

**Note-Taking, or Printing Selected Portions**

This is accomplished by using the "Print Screen" facility of the IBM-PC. Note on the keyboard that immediately below the carriage return key is a key which is marked in this way:

| |
|---|
| PrtSc<br>* |

By turning on the printer, and then hitting a Shift key and the Prtsc keys simultaneously, any materials displayed on the screen will be printed on paper. There are two Shift keys on the next to bottom row of keyboard, each marked with upward-pointing arrow. One can first turn to the desired pages on the screen then invoke the print procedure to copy only the displayed pages and no other.

You can exit now by hitting Escape; then make a selection from the menu. Good reading!

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The text is arranged with several empty lines to separate each screenful of material. At the bottom of the first screen is the reminder,

"Turn the page now by hitting—PgDn—Key on right of keyboard!"

The A.TXT file is a short menu file, which returns to the screen after every operation, looks like this:

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Table of Contents/To access any reading, enter number at DOS prompt below: Return to Introduction by entering "intro" at prompt.

1.) Chomsky and Skinner [Theories of Language & Meaning]
2.) Structures of Meaning [Music and communication]
3.) Dyslexia and Computers [Test of McLuhan theories]
4.) TNT [Tracking and Targeting Mass Communications]
5.) News Reporting and the Social Process [Nature of News]
6.) Politics of Technique [Role of media consultants]

To print any reading, turn on printer and (at the DOS prompt) enter the number above accompanied by the letter "p" with no space between them. Like this for Article 3: A>3p <– –

To quit work, merely remove disks and turn off the computer.
This can be done at any time.

= = = = = = = = = = = = =

**Reading/Printing Batch Files**

This particular textbook-on-a-disk has six chapters. There-

**continued on page 159**


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**Configuring Your Disk continued from page 153**

so they can be deleted.

This batch file can be made even more useful. Your hard disk will slowly accumulate files you do not need. For example, Wordstar stores the old version of your files with a .BAK extension, and compilers often create files with an .OBJ extension that are not needed after the files are LINKed. One way to delete these files is by adding a lot of lines to the above batch file like:

ERASE C:\WORDSTAR\PERSONAL*.BAK

This is, at best, tedious and it requires constant attention as the layout of your hard disk changes.

A much better way to automatically delete unwanted files is with the free program SWEEP.COM. To create SWEEP.COM, you run the basic program printed in *PC Magazine*. While you are at it, you will also want VTREE.COM, which shows a graphic (even in monochrome) map of your hard disk. SWEEP.COM causes a command to effect all subdirectories below the one in which it is issued. So:

SWEEP ERASE*.BAK

would erase all .BAK files on the hard disk if issued from the root directory. So now the improved hard disk backup preparation batch file looks like:

```
CD\
SWEEP ERASE*.BAK
SWEEP ERASE*.OBJ (IF REQUIRED)
DIRSORT EN\S
FILEFIND*.* > C:\BAT\LISTING.TXT
```

Making just one backup of a hard disk is not enough. You need at least two copies of your backup diskettes. One should be near the computer to allow you to backup files you accidentally erase. This backup will not protect you against fire or theft. For this, you need a second backup copy at a remote location. Because BACKUP is SLOW, you may want to produce this second copy using the DOS DISKCOPY command to copy the first set of BACKUP diskettes.

A major problem with the DOS BACKUP and RESTORE procedures is that they are slow. Backing up a 10M hard disk can take up to an hour depending on the amount and size of the files. And you must sit there and feed the machine a formatted floppy every few minutes. To get around this problem, several companies have come out with utilities to perform the same backup and restore functions faster. The fastest of these is Fastback. Fastback also has several problems. 1) It is copy protected. And 2) It does not create DOS files, so nothing but Fastback can use the files. Other slower backup programs are available that address these problems.

A problem with any type of backup is copy protected programs. In general, you can backup a hard disk with a copy protected program installed BUT you can not restore the hard disk without damaging the copy protected program. (WARNING: Check the manual or with the vendor of all your copy protected programs before you backup or restore your hard disk using any method.) My own personal solution to this problem is that I will not install any copy protected program on my hard disk. Copy protection has caused hard disk owners so many problems that many major vendors (like Microsoft) are removing copy protection from their programs. It is now possible to buy excellent non-protected software of any type, from accounting to word processing. The best solution to the problems of copy protection is not to own any, the next best solution is to understand each program's requirements for backups and restores.

Another solution is to remove the copy protection yourself. This **MAY** violate the shrink wrap license that came with your software. It may also violate the copyright laws or your company policy. If you want to try it anyway, you need a copy of CopyWrite. This set of programs will remove the copy protection from most copy protected software.

For important files (like the one containing this article), I also use another form of backups. I have a subdirectory just for "old" copies of files. Every time I make a major change to a file, I first copy it to this subdirectory with a number extension. So the first version of this article is HARDDISK.001, the second is HARDDISK.002, and so on. This way, I can always go back to an earlier version if I decide I do not like the changes.

I also never erase files. I have a discard subdirectory. Instead of erasing files, I copy them to the discard subdirectory then erase the version in the original subdirectory.

**continued on page 161**


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**Farewell Gutenburg!**
**continued from page 156**

fore, it will require six short batch files for bringing chapters to the screen, and six for sending entire chapters to a printer. For each chapter, the form is the same; only the name of the chapter file need be changed. For reading a chapter on the monitor, the batch files (named 1.BAT, 2.BAT, etc.) follow this model:

```
echo off
browse chomsky
type a.txt
```

Translation: The first line turns off echoing latter commands to screen; the second line summons the text "chomsky" to the screen under the control of the BROWSE.COM utility; after the entire piece has been read, the third line brings back to the screen the initial menu of options.

For printing out complete chapters on paper, the batch files (named 1P.BAT, 2P.BAT, ETC.) follow this model:

```
echo off
copy chomsky prn:
type a.txt
```

Translation: The second line sends the text of "chomsky" to the printer. The third line returns the options menu as soon as printing is completed.

This method of printing will scroll the text continuously on continuous paper, without regard for perforated page breaks. If page breaks are desired, you must embed the Control-P command at appropriate places in the text. Their presence will not disturb the reader at the console and will make the printout that much more elegant. However, continuous scroll printouts are acceptable, I have found, to most readers after they grow accustomed to the format. Indeed, many of them prefer it that way.

The completed disk will then contain six chapters of text, the various instructional texts and menus, and a variety of batch files. The directory of my Textbook-on-a-Disk looks like this:

| | | | | |
|---|---|---|---|---|
| COMMAND | COM | 16325 | 7-02-84 | 10:00a |
| 1 | BAT | 30 | 8-02-86 | 9:24a |
| 1P | BAT | 37 | 8-02-86 | 9:24a |
| 2 | BAT | 29 | 8-02-86 | 9:24a |
| 2P | BAT | 36 | 8-02-86 | 9:25a |
| 3 | BAT | 35 | 8-02-86 | 9:25a |
| 3P | BAT | 42 | 8-02-86 | 9:26a |
| 4 | BAT | 26 | 8-02-86 | 9:26a |
| 4P | BAT | 33 | 8-02-86 | 9:26a |
| 5 | BAT | 27 | 8-02-86 | 9:27a |
| 5P | BAT | 34 | 8-02-86 | 9:27a |
| 6 | BAT | 34 | 8-02-86 | 9:28a |
| 6P | BAT | 41 | 8-02-86 | 9:28a |
| A | TXT | 1024 | 8-04-86 | 7:22a |
| AUTOEXEC | BAT | 32 | 8-02-86 | 8:32a |
| BROWSE | COM | 1520 | 4-06-86 | 10:17a |
| CHOMSKY | | 52736 | 8-03-86 | 8:05a |
| CONSULT | TXT | 59347 | 8-04-86 | 3:42p |
| DYSLEXIA | TXT | 40448 | 8-04-86 | 7:36a |
| INTRO | MSS | 4416 | 8-07-86 | 2:00p |
| INTRO | BAT | 32 | 8-04-86 | 7:21a |
| NEWS | | 49152 | 8-04-86 | 2:27p |
| THEORY | | 51712 | 8-04-86 | 7:55a |
| TNT | | 41472 | 8-04-86 | 9:07a |
| 24 Files | | 318620 Char. | | 4096 Free |

**Installation Routine**

A legal complication must be dealt with. It is illegal to include IBM's or MicroSoft's copyrighted DOS systems on any disks offered for sale to the public. You have the right to use DOS yourself and to include it on disks that students will use on computers, each of which was sold to the university with a licensed copy of DOS. But, if you offer your Book-on-a-Disk for sale to the general public, you must include a small installation routine so each buyer can transfer legal DOS to the purchase.

Thus, all the components of the program would be present on a disk that lacks the two hidden system files (for IBM, they are IBMDOS.COM and IBMBIO.COM; for MS-DOS, they are IO.SYS and MSDOS.SYS), and the COMMAND.COM file). Space could be left for the system tracks to be transferred directly using SYS.COM; or, the user would be instructed to format a blank disk with the /S option. Then the book files could be moved to the new disk with the COPY command.

An INSTALL.BAT file might be included that would do all this automatically, instructing the user how to insert the DOS disk and the master book disk.

There is also the issue of using copyrighted text materials. If you wish to put together a collection of other peoples' writing, of course you will need permission. The status of disk publishing of text materials will be clarified in

**continued on page 163**


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# Extended Batch Language: Powerful User-Supported Software

by Hal Nieburg

MSDOS provides an invaluable set of tools in the form of BATCH command files. But they are severely limited. Many of these limitations are removed in a "freeware product" which deserves to be better known. It is Extended Batch Language (EBL) which is available gratis on bulletin boards, or for a contribution of $5 for software only, or $30 for printed documentation, support, and updates from the software's creator, Frank Canova, Seaware Corporation, P.O. Box 1656, Delray Beach, Florida 33444.

BATCH files are capable of doing many useful tasks. Complex tasks can be reduced to single commands, and routines can be automated, with interactive features, to standardize major computing functions.

The most serious limitation is that the MicroSoft facility has a very limited vocabulary. On the other hand, EBL offers an array of functions and capabilities, which make it almost as powerful as BASIC, and just as easy to use. EBL's extended vocabulary permits BATCH commands, mixed into DOS commands, to perform such functions as making full use of screen colors and embellishments, truly interactive routines, an increased range of variables, adding such commands as CALL, STACK, INKEY, TRACE, global variables, etc.

### What A Great Idea!

EBL is a high level language that can be used as a direct replacement or in conjunction with DOS batch files. It has superior control structures, string handling, and user interfaces. It also has tracing facilities, and is easy to learn and use. Many aspects of the language are like BASIC. It provides:

—Better control of messages to the screen.
—Accept responses from the user and create responses to programs.
—String handling operations (substring, length, etc.)
—Arithmetic expressions and assignments
—Comparisons and program return codes
—Search for files or tell if they exist
—Complete freedom to mix DOS and BAT commands within the same control file

Lets look at how it measures up to today's DOS...(Figure 1).

On Bulletin Boards, the program can usually be found in a single squeezed package BAT.ARC, or in three files: BATDOC.BAT, BAT.COM, BATDEMO.BAT.

Small and powerful, the memory-resident portion, which must be loaded prior to running EBL files, takes only 9K of disk and memory space. While writing programs in the language, help is available at any time by entering BAT at a DOS prompt.

EBL will provide conveniences for every level of user. For the system programmer who needs to do long sequences of tasks between linker, compilers, debuggers, and editors. He can now create an intelligent link between these programs. For instance, he may wish to do a link depending on if the previous compile was successful. He can also respond automatically from a keyboard "stack" into various utilities.

For the office worker who has several types of tasks to perform (word processing, accounting packages, etc.) and requires a simple way of changing from one type of task to another, perhaps with optional help text.

For the young user who wishes to go from one game to another without having to learn the system commands required to make each available.

For industrial users who wish to automate long, boring tests and procedures on the personal computer. An excellent tool for a manufacturing line.

For all of them EBL can create a friendly control interface.

### Some Functions

EBL operates from by adding the word BAT at the beginning of each line. Lines without that prefix will run under ordinary DOS, while those having the prefix will run under the memory-resident interpreter, switching back-and-forth silently and imperceptibly. Figure 2 provides a list of all EBL commands.

See Figure 2 on page 164.

The BAT TYPE command can be used for something as simple as saying hello! For example:

BAT TYPE HELLO THERE

You can also put DOS variables into this command to display their contents. For example, if the "TRIAL.BAT" file contained the line:

BAT TYPE HELLO HERE %1 %2

Then we start the BAT program from DOS, we might enter:

TRIAL COMPUTER USER

DOS will automatically store the words after the pro-

Continued on page 162

| Function | DOS | Extended Batch Lang. |
|---|---|---|
| BEEP | | X |
| CALL/RTN | | X |
| CLS | X | X |
| BEGSTACK | | X |
| BEGTYPE | | X |
| EXIT | X | X |
| GOTO | X | X |
| IF | Limited | X |
| INKEY | | X |
| READ | | X |
| READSCRN | | X |
| SKIP | | X |
| STATEOF | Limited | X |
| STACK | | X |
| TYPE | Limited | X |
| Assignments | | X |
| TRACE | | X |
| DOS Vars | X | X |
| Global Vars | | X |
| Return Codes | X | X |

FIGURE 1


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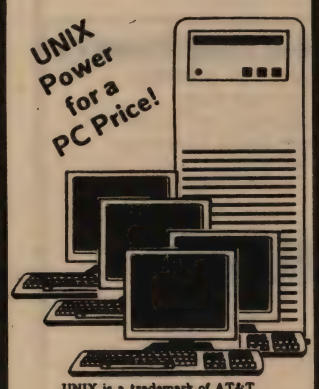


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**Configuring Your Disk**
**continued from page 158**

When I get about 360K of files, I copy them to a floppy then erase the discard subdirectory. (With some versions of DOS, a file will take a lot less room on a floppy than on a hard disk. So do not be concerned if you copy 360K to a floppy and do not fill up the diskette.) I then store the floppy in a safe place. This allows me to retrieve any file I have ever produced. To aid in retrieving files, I use the IBM Office Correspondence Retrieval System to index the files on the diskette.

No matter how well you plan, no matter how many backups you make, sooner or later you erase a file you need and can not get back from storage. To plan for this you should go out right now and purchase the Norton Utilities. When you erase a file, it is not removed from the hard disk. All that happens is that its location is removed from the map of the hard disk (FAT). If you try to unerase it right away, you can almost always get it back. The longer you wait, the more likely DOS will reuse the space the file used, making unerasure impossible. That is why its too late to purchase the Norton Utilities when you need them. The utilities also have programs to sort files and subdirectories into size, date, or alphabetical order; to find files lost in a maze of subdirectories, to find a string of text in some file and to perform more detailed tests of the hard disk than that performed by CHKDSK.

Those of you who already have hard disks can also use the tips in this article. If you have enough free space, you can create a new subdirectory, copy files from their current location to the newly created subdirectory, then erase the extra copy of the files. (WARNING: This method will most likely not work for copy protected software. Check the software manual or the technical support department on how to move the copy protected software to a new directory.) If you do not have enough free space for this, you will have to make some free space. First try:

SWEEP ERASE*.BAK
SWEEP ERASE*.OBJ

If that does not free enough space, you will have to copy some files to floppies and then erase them from the hard disk. After organizing your hard disk, you can copy these files from the floppies back onto the hard disk.

With proper planning, a hard disk can greatly speed up your computer work. Without that planning, a hard disk is several disasters waiting to happen. ●


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**Extended Batch continued from page 160**

gram name into its variables. Therefore, in the TYPE command, we will see contents of these variables on the screen. The resulting message would be:

HELLO THERE COMPUTER USER

There is a second method of putting text onto the display. This is with the BEGTYPE command. Although it will not display the contents of variables, it is very useful for displaying large blocks of text, such as menus. For example, if the "TRIAL.BAT" file contains:

```
BAT %1 = ABC
BAT %2 =
BAT IF ABC = %1  TYPE The variable contains ABC.
BAT IF %1 = abc  TYPE This also matches.
BAT IF 0 <> 00       TYPE These are different lengths.
BAT IF 0 < 00        TYPE 0 has a smaller length.
BAT IF 456 > 123 TYPE Numerically, 456 is bigger.
BAT IF 456 < %1  TYPE ASCII value of 456 is smaller.
BAT IF AABCD = A%1D TYPE Token substitutions are made.
BAT IF %2 <> %1  TYPE Variables are different lengths.
BAT IF .%2 = .       TYPE This matches if var is empty.
BAT IF BOX = BOX IF DOG <> CAT TYPE Did multi-if compare.
```

FIGURE 3

BAT BEGTYPE

This is a large block of text. It is useful for menus. Note that Upper/Lower case characters are displayed intact here. The block is always ended with "END" in the first column after the text finishes.

END

There is an additional advantage to using BEGTYPE command. This command can also highlight text to the user. This is done by using the form: [\\hex] within the text block. For example if the text block contained \\0F within the text, the result would be High Intensity Text ! By choosing different values, the screen attributes can be controlled to create inverted video, blinking, underlined, and very colorful text.

In order to get input from the user, there are two available commands, READ and INKEY. When the command word READ is seen in the batch file, an input line is accepted from the user. All function keys are assigned to the normal DOS edit functions. When ENTER is pressed, the input line is assigned to DOS variables. Each word will be assigned in order to the variables indicated after the READ command. For example:

BAT READ Please enter your name = => %1 %2

This would prompt the user and wait for him to enter two words. These words will be saved in the %1 and %2 variables.

To get a single keystroke from the user, the INKEY command should be used. This command will wait for the user to enter a single key on the keyboard and return its value in the optional variable. This key can be not only letters, but all function keys, control keys, etc. For example:

BAT INKEY Press any key to continue... %0

There are several ways of controlling the order of execution of a program written with Extended Batch Language. GOTO, CALL, RETURN, and IF are all commands that do this. The simplest is the GOTO command:

BAT GOTO -LABEL

If this line is put into a ".BAT" file, then it will stop execution at this line and resume at the line within the file which contains:

BAT -LABEL

This is an unconditional branch. If the label is not present within the file, an error will result. Note the minus (-) sign before the label name. This is done so that BAT can tell the difference between a label and a command within the language.

A CALL command is similar to a GOTO command. The primary difference is that the line where the CALL command was is saved away. Then a branch to a label is done; when a RETURN command is found, the last line that was saved is now restored. Execution resumes at the line following the original CALL command.

The final way to control the flow of an EBL program is to use an IF command. The general form of this command is:

BAT IF <word> <condition> <word> <operation>

**continued on page 163**


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**Farewell Gutenburg!**
**continued from page 159**

the future, but in the meantime, should be considered the same as other forms of commercial reproduction. If you originate all the text material yourself, copyrighting is recommended; it is a good idea to protect the author's rights in any future uses of the material.

### Conclusions

Once the Book-on-a-Disk is complete, one can prepare a disk sleeve with an attractive cover, complete with title, author, publisher, and appropriate graphics and pictures. Software is available to design and print the cover which can then be pasted onto the disk sleeve; or one can go to a real printed glossy cover, or a simple label on the unadorned protective sleeve.

It is my hope that fellow-teachers will realize the potentials sketched in this article and strike a blow against old-fashioned publishing and the multi-national conglomerate corporations that have taken over the publishing industry. Let them perish, while we publish!

But, it is hoped other authors will see the potential also, and start a new form of publishing for all kinds of materials, realizing not only a whole mountain of new uses for the technology, and a new form of instant publishing, but more important, the realization of new dimensions of democratic life and self-expression, the further fulfillment of the American dream of individuality and personal independence! ●

**Extended Batch**
**continued from page 162**

Each word can be a fixed string of letters, or a variable, or a combination of each. The conditions can be:

< less than
= equal to
> greater than
<> not equal to

For example, all of the following IF statements will compare correctly and execute their corresponding TYPE command. The first two statements will initialize variables used in the IF commands. (Figure 3).

There is a method within the BAT language for answering questions from programs without operator intervention. This is done by a "keyboard stack." By entering data into the stack, you will essentially be entering data through your keyboard when any program requests it. In this way, a batch file can now answer questions programs may have by "typing" them for the user.

The size of the keyboard stack defaults to 512 bytes. This value can be changed by making the first statement which is executed by the Extended Batch Language program be of the form: BAT * size. Size is the decimal number of bytes to reserve for the stack. This must be executed, for instance, when a system reset is performed because once this area is installed, the size is never altered until another system reset.

The results of programs often need to be known so that some action can take place after the program ends.

When the command word READSCRN is seen in the batch file, a line of text is read from the display screen into variables. Having the ability to read text from the display can be useful for determining the result of another program, or making a query for some system status which would not normally be available within a batch file.

For example, as Canova points out in the excellent tutorial provided on the disk, by reading a directory from the screen, a series of files can be submitted to the macro assembler. Once the assembly is completed, the status can be read from the screen to determine if there were errors which would stop the link step. Virtually any message which a program can generate can be used as feedback to batch file by using READSCRN.

If the first character in the command is a "%" (Percent sign), then it is considered to be an assignment statement. The first variable cannot be any predefined variable (such as %R or %%), but may be any of the other variables %0 to

**continued on page 164**


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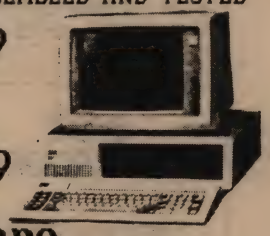

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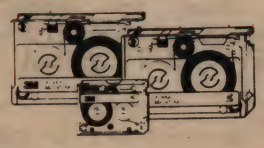

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**Extended Batch continued from page 163**

%9 and %A to %O. If a DOS command is later executed and uses one of the variables %0 to %9, it will be properly replaced with the contents of that variable.

As an aid in debugging, the TRACE.ON command enables a trace flag which causes each line in the BAT program to be printed as it is executed. Three "+" (plus) symbols will precede the BAT statement which is printed out as an aid. The trace can be turned off at any time by the TRACE.OFF command.

A trace can be active during DOS commands within the BAT program. In addition, trace can be enabled/disabled at any time, even in immediate mode. Once enabled, it will remain in effect until the TRACE.OFF command is executed. Errors, execution of other BAT language files, and even executing DOS commands will not change the trace mode.

There are additional variables %A thru %O which are called "global user variables." These variables are used exactly like the variables supplied by DOS (%0 to %9) with two exceptions. First, the contents of these variables are maintained between execution of batch files for as long as the system is powered on.

This "global" feature is useful for keeping indicators BETWEEN "sessions" of the user. Second, because DOS does not know about these variables, they \0fcannot\07 be used as variables within any DOS command. So while

**continued on page 165**

```
EXTENDED BATCH LANGUAGE   Version 2.04   (C) Copyright Seaware Corp 1982,83,84
                                         (C) Copyright Frank Canova 1982,83,84

Batch file commands [operands]                  Batch file statement:
  BEEP       [stmt]                               BAT -[lbl] [cmd] | [cmd]
  BEGSTACK...[text] [\hex] [;]... END
  BEGTYPE ...[text] [\hex] [;]... END           Control Functions:
  CALL      -[lbl]                                STACK.ON
  CLS        [stmt]                               STACK.OFF
  EXIT                                            STACK.PURGE
  GOTO      -[lbl]                                TRACE.ON
  IF         [token] < = > <> [token] [stmt]      TRACE.OFF
  INKEY      [text] [var]
  READ       [text] [vars]                      Variables:
  READSCRN   [vars]                               %0 to %9 - DOS Vars
  RETURN                                          %A to %O - Global User Vars
  SKIP       [numoflines]                         %Q - Stack status
  STATEOF    [filename] [drive_list]              %R - Return Code [0:4FE]
  STACK   ...[tokens] [;]...                      %S - Space Literal
  TYPE    ...[tokens] [;]...                      %V - Default Drive
  [var]  =  [token] + - * / # $ [token]           %% - "%" Literal
  * [comment]

C:\
```

FIGURE 2

# PRESET For Networks

PRESET For Networks is a network-compatible printer setup program which gives the user direct control over printer setup features such as type styles, fonts, margins, tabs and page format. Over one hundred dot matrix, letter quality and laser printers are supported.

PRESET For Networks ensures that multiple intervening users of a network printer can set up any printer according to their own requirements and not worry about the printing activities of other users.

PRESET For Networks allows the user to combine printer setup features into suites, which are unique groups of features chosen by the user. The suites are named by the user and systematically stored on the disk. Suite construction is simplified by the use of printer-specific feature menus and context-sensitive help messages. The stored suites can later be requested by name from the DOS command line.

To set up a printer the user specifies both the suite he wants to use for printer setup and the name of the network printer to be set up. PRESET For Networks uses the DOS Network Printer Setup function to instruct DOS.

Thereafter, all print jobs originating from the user's computer, destined for the specified network printer, will be automatically preceded by DOS with the suite data. When a suite is selected for a local (non-network) printer, PRESET For Networks downloads the suite data directly to the specified printer.

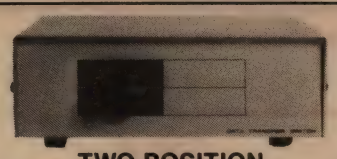
Each user on the network can run PRESET For Networks concurrently with different setups defined for the same, or for different printers. Every user can set up every printer simultaneously without conflict.

### Requirements

PRESET for Networks will support as many devices (printers and computers) as the network allows, and requires an IBM PC/XT/AT or compatible computer, MS-DOS or PC-DOS 3.1 or greater, and a Local Area Network such as the IBM PC LAN, Novell, or other network supporting MS-DOS or PC-DOS.

PRESET For Networks is offered at an introductory price of $295 for a ten workstation license. A single-user, non-networkable version of PRESET requiring DOS 2.0 or greater is available at a price of $69. Neither product is copy-protected.

For more information contact Laser Age Software Company, 1831 Prosser Ave., suite 204, Los Angeles, CA 90025. (213) 470-1397. Mention that you read about it in *Computer Shopper*. ●

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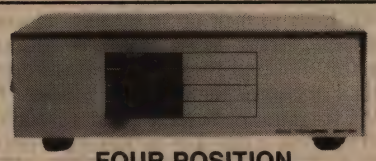

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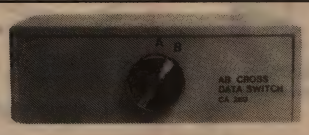

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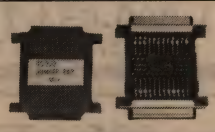

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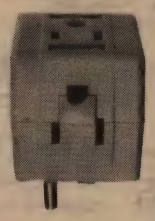

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The Gold Key Converser converts the parallel port of an IBM PC or compatible system to a serial port, allowing you to drive a serial printer. Featuring an internal data buffer to store the computer's output, this compact device connects directly onto a parallel printer cable and eliminates serial interface cards.

Completely transparent to a computer and printer, the Gold Key Converser supports the most common serial protocols, XON/XOFF and DTR, making it ideal for use with IBM PCs and DEC printers. Compensating for slower printing speeds, two models are offered: the PS-16 with 16K bytes of buffer memory and PS-64 with 64K.

The Gold Key Converser Model PS-16 is priced at $149 list and the Model PS-64 sells for $229 list.

For additional information contact Gold Key Electronics, Inc., 11 Cote Avenue, P.O. Box 186, Goffstown NH 03045; (800) 325-0150; (603) 625-8218.

Mention that you read about it in *Computer Shopper*. ●

**Extended Batch**
**continued from page 164**

"COPY %1 %2" is valid, "COPY %A %B" is not. If you wish to use them within DOS commands, they must first be copied via a statement like "BAT %1 = %A."

The STATEOF command will search all disk drives for the existence of a file. The name after the word STATEOF can be a specific name, general name with wildcard characters (e.g. *.EXE), or it can be a name with a specific drive specification (e.g. A:PE.EXE). In the last case, only drive A: will be searched instead of all available drives. Note also that a variable can be used instead of a file name. In this version of BAT, only files in the current directory (no paths) can be found. The return code variable %R is used to indicate the result of the search for STATEOF.

If a you wish to put more than one command on a line, the vertical bar ":" is useful. When used with an IF command and the test for the IF conditions fail, the entire rest of the line will be ignored. Multiple commands within a BAT statement is very useful when combined with the IF command. For example:

BAT IF %A = abc TYPE this : CALL -that : GOTO -other

If a comment is needed within a BAT program, the "*" (star) character is useful. When used after the word BAT, all characters which follow will be ignored. For example:

BAT * This is a comment to the programmer.

EBL language is a bold and original concept, offering a set of powerful tools for interfacing programs and managing multiple complex tasks. Frank Canova has done a useful piece of work which deserves to be better-known. Fans of BATCH language will flock to his door! ●


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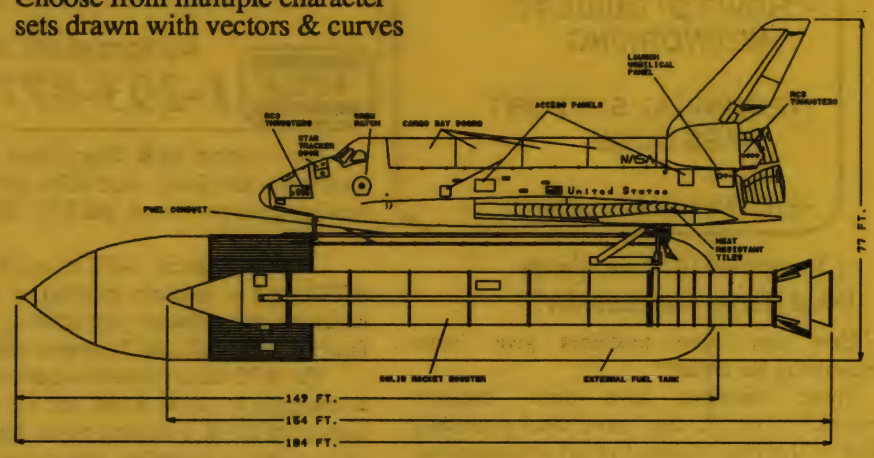


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# Rescuing Priceless Data From Crashed MSDOS Disks

by Hal Nieburg

There is no grief so profound (ranking with the loss of a loved one) as losing, with no backup and no hard copy, the results of hours of original work. This is especially true of original prose. The moment of truth can never be reconstructed.

The process of composition of a word processor is an intoxicating experience. Starting slowly and painfully, the writer paints some words on the screen. Then, inexplicably, the spark slowly builds, a bit of editing here and there, adding spontaneous thoughts, moving a sentence or a paragraph. Suddenly, a blazing fire of creativity, an explosion of architectonic words, luminous steeples, showers of sparks in all directions...

The emotional outpour has a momentum and sweep of its own, carrying away the writer into a state of transfiguration. Glowing with the power of unconscious writing, time disappears and the writer allows his/her fingers to dance on the keys with abandon. And the ineffable text appears on the screen and grows and grows...

If the product is lost, the grief is close to madness. Such moments can never be recreated a second time. To attempt to recreate the session from memory or from notes is impossible. The best that can be hoped for is that the second effort will also burst into flames and fill the void. But the result in each case is different, and the sense of perfection and inspiration of the first piece is lost forever... It is like shooting a role of 35mm film and then finding that the film failed to engage the winder. The terrific pictures exist only in the mind and the film, never drawn from the cartridge, is totally blank!

### Oh Break My Heart!

A disk crashes unexpectedly, and for no apparent reason. Our concern is mainly with floppy disks here, although much also applies to hard disks. With floppies, this can happen in many ways. The directory or the File Allocation Table (FAT) are damaged. Stray characters creep into files so that some errant EOF (End-of-File) symbol cuts untimely into the file's body. The file disappears from the directory, or it is there but has been reduced to 512 bytes of gibberish. Or it cannot be read and loaded into the computer. Or all attempts to access the disk fail, returning the message "Divide Overflow," or, the ultimate message of doom... Not ready error reading Drive B
Abort, Retry, Ignore?

Who has not had this experience? One takes a disk that performed perfectly when the last work session ended. The disk is placed properly, the Write Protect tab is removed, and all seems normal. The word processor program is loaded and one proceeds to read the file into working memory.

Alas, something is wrong? Instead of loading the old file, the word processor says "file not found," or attempts to offer to create a new file of that name. The user does a directory of Drive B to be sure the name is correct and that the file is there. One of the terrible fates is in store and, for whatever reason, the brilliant words you know were once on the disk are now, seemingly, beyond the reach of human or computer. The roll of film appears to be blank! All those wonderful shots of Hawaiian volcanoes gone forever and no chance for another Hawaiian vacation for years... You suddenly discover how much you care!

But is the data really lost

continued on page 167


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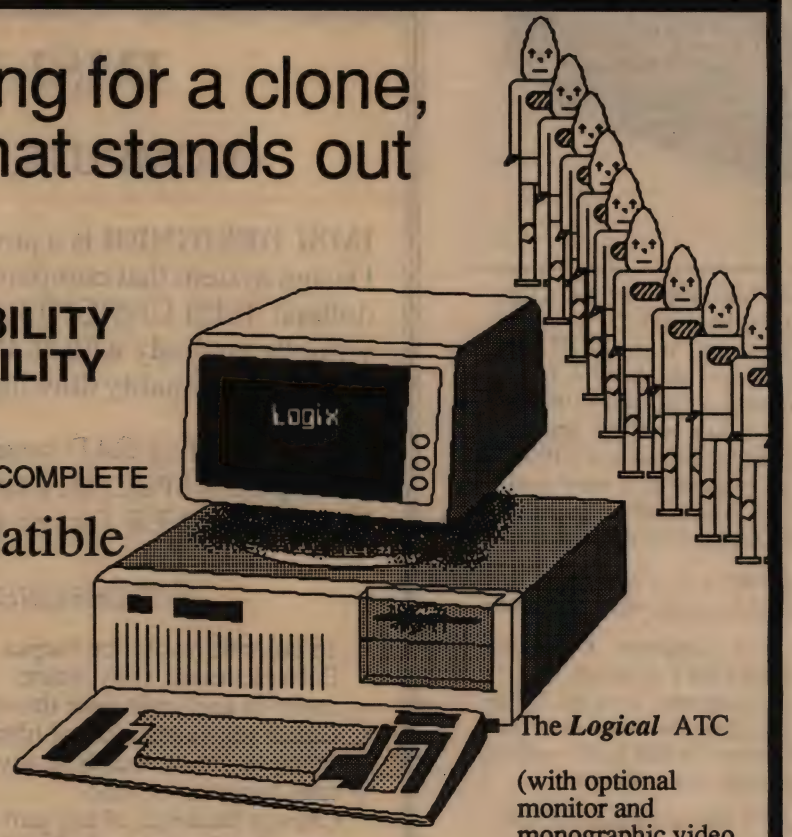


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**Rescuing Data continued from page 166**

forever? The wonderful news is "NO!" In fact, anything that has been "written to disk" is likely to still be there, in whole or in part. Even "erased' files are probably intact long after being mistakenly erased. And a few simple tricks and some disk utilities can often recover lost data! Using these procedures can prevent heartbreak for oneself and one's friends.

One can be regarded as a Saint? Paragon of virtue? Allwise Guru? Magician? It is easy. All you have to do is salvage a friend's lost data on a crashed disk. It is like saving his/her child from a raging rapid or a house fire. It is the truest service a friend can render, except possibly giving one's life for a friend, save another.

### Disk Structure

Beneath the surface of the diskette is a world of wonders and mysteries. This world is made up of such curiosities as a Boot area (sector 00), FAT-File Allocation Table (sectors 1-4), root directory (sectors 5-11), and data area (sectors 12-719), all made up of tracks, sectors, reserved sectors, hidden sectors, clusters, hexidecimal bytes, and addresses. These compose the architecture of memory and disk storage, the standard pattern for arranging magnetic signals on the iron oxide surface of the mylar disk.

The pattern is standardized by DOS (the disk operating system) so that the drive heads, like the heads of a tape recorder, may read and write the disk's magnetic record. The heads of disk drives are much smarter than those of tape recorders. They not only read the series of signals but can quickly jump from one specific address to another; can decipher the FAT and find specific files; can read and write with a precision and speed that boggles the mind, finding and tucking data into dozens of scattered slots.

The standard disk format (DOS 2.0 and above) is 40 tracks, with 9 sectors per track. Space for files is allocated in clusters of 2 sectors each, for a total of 720 sectors of 360 clusters, each of which is composed of 512 bytes per sector or 1,024 bytes per cluster. The FAT, the important File Allocation Table, tells the smart head where everything is, and what sectors are open for writing new data.

The boot record, the first sector on each diskette, is one sector in size; it has an ID marker on the last two bytes, set to hexidecimal 55AA to indicate formatting (DOS 2.0 above) of nine sectors per track. There is an odd number of sectors, so the double-sided format has one cluster per sector that wraps from side to side of the disk. There are two copies of the FAT on the disk, taking up four sectors. The directory is four to seven sectors, with room for 64 to 112 entries, depending on whether the drive is single or double-sided.

The two hidden system files can be viewed, even though they cannot be accessed by the directory command. They are called IBMBIO.COM (basic input/output processes) and IBMDOS.COM (the disk operating system, per se). The third system file, COMMAND.COM, is treated as an ordinary file and does not have to be at any fixed location.

When a file is erased or deleted, only its directory listing and FAT address are changed. The first letter of the file name is changed to a question mark, so that the name is no longer picked up on a DIR command. Further, the FAT cancels allocation of reserved space for the actual data. The drive head checks the FAT before reading or writing to the disk. Once a file space allocation has been canceled, the head will not read the data, or will use the space to write a new file. The data in the body of the file is not affected right away, but remains intact for a long time, even when the disk has been written-to many times. Often, only part of the data is overwritten, and much of it can be reconstructed.

### Some Prevention Tips

Disk operations, even after all these years of everyday use, still hold some mysteries. The vague magnetic pulses on the iron-impregnated mylar surface, reliable and tough as they usually are, sometimes do strange things. Sometimes the first 00 track dies for no apparent reason, so the head cannot find the FAT and cannot read or format the disk medium. A tiny speck of dirt, on the surface of the mylar or on the head itself, may have pricked the iron oxide microscopically.

Some light oil from a stray finger tip? A bit of airblown mucous from a disremembered sneeze? A slight variation in

**continued on page 168**


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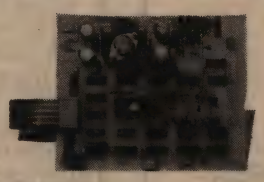

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**Rescuing Data**
**continued from page 167**

electrical current in the middle of saving a file to disk? Wear caused by using the same working disk too many times?

I have found many floppy crashes caused by what may be considered bugs that, inexcusably, still exist in DOS. When the same disk has been used over a long period of time, many files will have been written-to-disk, deleted, edited and re-saved, many times. In the initial use of a disk, files tend to be written in integral units, that is, in contiguous clusters, sectors, and tracks. However, in further use, files tend to change size, growing or shrinking though different revisions.

The disk is increasingly crowded, and the revised files no longer fit in the same slots. Therefore, they are written into a whole series of separate locations, a few clusters here and a few clusters, sectors, tracks there. As this happens, the FAT attempts to monitor and control things, keeping records of the addresses of all the parts, and causing the heads to jump about collecting and assembling the various parts when reading a file to the RAM and screen.

This process can be stretched to the breaking point, after which the FAT begins to falter in its job. Files may intersect. Intertwined chains and clusters of different files may be accessed together; some addresses will be off, and some directories may even be damaged as a result of multiple reorganizations. Mechanical problems can have the same effects, caused by dirt, variations in head movements, shock, stray magnetic fields, imperfections in disk surface, etc.

But it seems to me that built-in bugs in DOS itself can also cause the problem. MicroSoft and IBM have provided remedies for some of these problems. Use of the DOS utility CHKDSK.COM can diagnose such problems and sometimes (with the /f command) correct them, refreshing the FAT and cleaning up dislocated data. FORMAT.COM will locate and seal out bad physical areas of a disk ("bad sectors") and prevent the FAT from attempting to write in that space.

To avoid crashed disks which may be caused in any of these ways, I offer several recommendations:

(1) Don't use the same working disk too long. Format another disk and move the files with the COPY command to the new disk. Do not use DISKCOPY.COM for this purpose. The latter only makes an exact copy of the whole disk, duplicating the same dispersion of files as on the source, incipient problems and all. On the other hand, using the COPY command (on a newly formatted disk) reorganizes all the files into simple contiguous spaces, creating a virgin and simple FAT. This process will even retrieve stray clusters and reinsert "lost data chains" into the correct files. There are commercial products which perform the same functions, but they are unneeded. The process described here will do the job perfectly well.

(2) Run the CHKDSK/F routine on a disk after every half a dozen uses. This will clean up the FAT and keep things under control, preventing and postponing the need to follow the previous procedure to intervals of many months.

(3) By all means back up all work every day on a second desk. Even a third backup is desirable. Disks are cheap, data is irreplaceable. I keep two working disks of all data at home (where I do most of my writing), and, in case a fire burns down my house, a third copy in another place (my office) preferably in a grounded metal box or file cabinet (as a magnetic shield). The backup at home is updated after every work session; the copy in the separate location, every week or so.

(Beware having too many different copies not updated! You can reach a point where you are not sure which is which. Here the date on the file can be very important. This is an argument for entering date and time every work session, or installing a clock/calendar card.)

(4) Back up working files on the same disk. Many word processors allow the user to write a backup file (with extension BAK) automatically when resuming work. This keeps a pristine copy of the file side-by-side with the day's revisions. If lightning strikes, or the house electricity goes dead in the middle of saving the working file back to disk, one can lose only part of the revisions. Frequent saves of the working file (even every few minutes) will prevent loss of work that exists only in memory, in the event

**continued on page 169**


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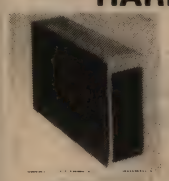

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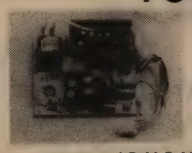

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**Rescuing Data continued from page 168**

of a power failure, or keyboard lockup. Occasionally, take a moment to save the revised work into the second backup copy on the same disk.

### Retrieving Crashed Files

Good housekeeping habits, like those described above, will prevent many crashes. But crashes can and will occur anyway!

Before you do anything else, exercise the R (Retry) or I (Ignore) options. When the "Abort, Retry, Ignore" message strikes, always try R a couple times. If that doesn't help, then try I. Sometimes, one of these will rectify the mysterious problem, without further ado. "Ignore" sometimes will allow the computer to skip damaged bytes and read whatever text is still intact. Once a file has been loaded to memory, you can remove the suspect disk and insert a newly formatted disk; and save the file back to disk. Important note: Always keep a couple formatted disks with plenty of room on hand!

Next step is to protect the suspect disk. Don't try to read or write anything more; rather lay it aside in order to safeguard whatever intact data it contains. Make an exact copy of it (with the DISKCOPY utility), so that the original damaged disk will not be further damaged by attempts to rescue data. In your further efforts, use the copy, not the original. After the data has been rescued (and backed-up again), then the original disk can be reformatted or discarded.

When Retry and Ignore yield no results, then it is time to contemplate more drastic remedies. There are two levels of data rescue:

(1) Reading the data off the disk to hard copy, sector by sector, and re-entering the material from the keyboard; and

(2) Rebuilding the damaged file so it can be accessed in the usual way, or reading the data into a new healthy file.

There are various DOS utilities and commercial products designed to do both. We are not concerned here with UNERASE functions, such as utilities that can be found on public domain bulletin boards, or can be purchased from vendors. These are readily available and familiar to most users. Their only function is to resurrect files (or parts of files and deleted sub-directories) that have been accidentally erased or deleted. This capability is useful and should be part of the arsenal of every computer work station. But our concern is with disks that are physically or magnetically damaged. In most cases, such disks cannot be accessed by disk repair tools; and UNERASE utilities are irrelevant.

### First Level Rescue

Reconstructing data on the first level is the most inconvenient. But in extremis, one will do anything! Lost data on a damaged disk can often be viewed sector by sector and, even if the file cannot be repaired, can be dumped to the printer by the PRTSC (print screen) key, screen by screen. Then the writer can reenter the data from the keyboard.

There are a host of utilities, both commercial and public domain which have this capability. The same end can be achieved with the use of DEBUG.COM which is a standard DOS utility. The curious name of the utility arose in the classic days of computing. Design errors in new technology have been called "bugs" since the invention of the computer. Computer programs usually have so many tiny errors, that the word seemed particularly appropriate in correcting program language.

There are a large number of DEBUG-like products on the market, such as Norton Utilities (Peter Norton, 2210 Wilshire Blvd. #186, Santa Monica, CA 90403; (213) 826-8032), Disk Mechanic (Software Tailors, Inc. & MLI Microsystems, Inc.), Disk Patch Utility (IBM), etc. All of these perform much the same functions, but interactively with attractive front-end menus and graphics. For many people, these products are easier to use and thus well-worth the few dollars of extra cost.

With the aid of DEBUG, one can jump into the inner

**continued on page 170**


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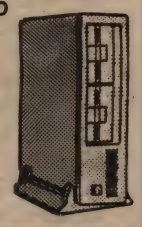

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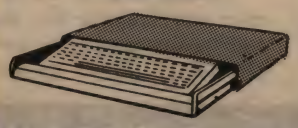

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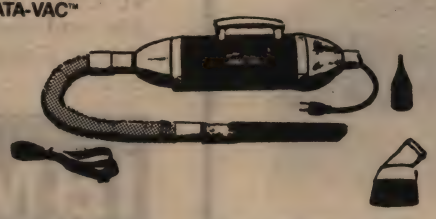

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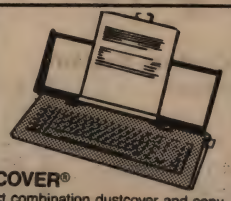

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**Rescuing Data**
**continued from page 169**

space at any point and look around. One will note where things are located on the disk. DEBUG dumps 128 bytes at a time, or one-fourth of a sector, one-eighth of the cluster. One can view an entire sector by four successive dumps; an entire cluster by eight. This method will read sectors even if the directory and FAT are irretrievably gone. There is a search facility but its uses are limited under the extreme conditions I have described.

This is the general method, but consult the DOS manual for detailed instructions. Put the damaged disk in Drive B. Load in the A drive a disk containing the utility file. It is usually on the supplementary DOS system disk. At the prompt, type:

A>debug b:

Since no file was indicated, the screen will give back a message "file not found," which can be ignored. This is followed by the "-" prompt. Type in a "d" (which means "dump") and hit return. The screen will display eight lines of 16 bytes each, total of 128 bytes.

The display will provide two sets of addresses in hexidecimal (hereafter "hex") numbers, separated by colons. This is on the left. First is the segment address where the file has been loaded into memory; next is the offset address, the location in the specific file from its first byte. On a 16-bit machine, these are always four digits, from 0000 to FFFF (equivalent in decimal form of 0 to 64,000). Next come the rows of 16 bytes, showing in hex what is contained in each byte. Hex numbers represent characters and, in the 8088 DOS character set, are always two digits, from 00 to FF (in decimal, 0 to 255). DOS accesses memory above FFFF by shifting registers, each one of which addresses up to FFFF -64K bytes.

The right columns (16 characters wide) contain the ASCII text that one is seeking. Fill the screen with dumps, then send to printer with PrtSc. Later, the hard copy can be read and reentered at the console.

One can move through the disk's sectors by merely repeating the "d" command; or can jump to a new disk area by adding an address larger than that of the last dump, either or both, the absolute address (the first four digits in hex) or the offset address (the last four digits in hex). The two parts of the address are separated by a colon. If only one address is entered, the display will jump to that offset number.

To locate and read data by this means is slow and tedious effort; but it may be necessary and, when precious work is at stake, no effort is too laborious.

For inexperienced users, a commercial disk tool might be preferred. All of them work equally well, but we will use Norton Utilities in our examples. This is how to use NU.COM. Put Norton in A drive and the damaged disk in B drive. Enter at the prompt:

nu b:

This will bring up the first of a series of menu screens. Select F1 (Change Selection). On the second menu, select F5 (Select Disk Sector). You may wish to try other commands at this point to check how much of the directory is still intact. Now you can enter a sector number and see it displayed.

Norton's greatest aid at this point is the search routine which enables you to identify the sector where the sought-after data may be located. On the first menu, enter F2 (Explore or discover disk information). Hit F7 (search disk for data). Hit F1 (Specify Where to Search), F2 (Specify what to search for), each time entering the correct instruction. Then hit F3 (Begin searching). Tell the program to search the "Whole disk" (F1), and it will dutifully perform, stopping to report a sector number when data is located. One can either go to the sector (by pressing any key other than Escape) or continue the search (F4).

Write down the sector numbers of the data for future reference. As you will soon see, we can use the number for other and better methods of retrieval.

One helpful wrinkle in Norton is the ability to display ASCII data in normal text mode, as well as in hex and ASCII columns. This makes it easier to read on the screen or from a PrtSc hard copy.

At this level of rescue, the user may regain the data in hard copy and then re-enter the file anew from the keyboard. This is a price many users will gladly pay. However, if the boot track is damaged, NU.COM may not be able to access disk at all.

**Second Level Rescue**

The preferred method is to move the data from the damaged disk to a file on a fresh disk with a healthy and normal directory and FAT! If this can be accomplished, and it often can, nothing is lost except the time it takes to bring about this miracle. The new file will be as good as new and can be normally accessed, edited, copied, formatted, and printed.

Begin the rescue with some preliminary procedures. Try copying the damaged files to a newly formatted disk, using the COPY (or XCOPY in DOS 3.2) command. If DOS reports read errors, choose the "Ignore" option and keep on going. If this fails, try to repair the disk by CHKDSK/F, running it several times until the FAT is clean. On the question, "Write the lost chains to files?", respond "Yes." Then try to copy the files to a fresh disk once again.

Next run the DOS utility RECOVER.COM on the disk and copy the resulting files. Bring up with your word processor the various files created by these processes; examine them to see what data they contain. If the stuff is there, merge and edit them to reconstruct the original work.

But there is a better way! And, although not quite a secret, is virtually unknown among computer Gurus and professionals. For this method, we are indebted to Bob Wallace, founder of QuickSoft Inc. (219 First N #224, Seattle, WA 98109,; 206/282-0452).

With this article, I am putting the world on notice: Here is the best possible solution for crashed floppies! Used in conjunction with Norton, this method dips into the chaos of a crashed disk, gathers up the

**continued on page 172**

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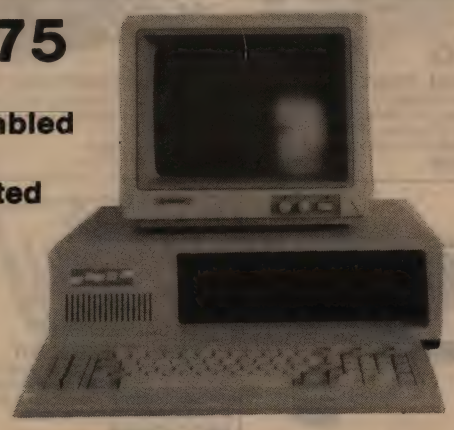

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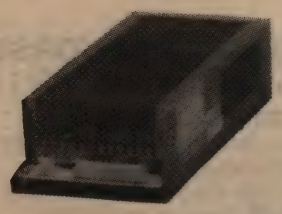

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**Rescuing Data**
**continued from page 170**

lost data, and writes it anew to a healthy file.

PC—Write contains several built-in utilities of interest apparently only to programmers, including changing the keyboard assignments, accessing the extended character set, reaching into designated sectors and clusters to view or edit the software, as well as to manipulate text files. Some of these extensions, which can be found in Versions 2.4 and later, need to be better publicized because they are of immense moment to all power users. Included in this category is a little-known procedure for saving damaged data files.

We will skip the details of running PC-Write. QuickSoft provides excellent free documentation on the disk, including a series of tutorials. The 180-page handbook on the disk contains the instructions for saving files, and much else, and has an excellent index. In brief, this is how it is done.

First, run Norton, or other similar disk tool system, and locate the data in question. Write down the sectors where the data can be found. Use his NU.COM or DT (disk test). Either will identify the sectors or clusters where the sought-after data may be located.

Second, place the damaged disk (that is, an exact copy made with DISKCOPY.COM) in Drive B. Load the PC-Write editor from Drive A by entering, at the prompt,

A>ed filename.ext

Follow instructions on the top line of screen to open a new file. Once this has been done, press F1 to enter command mode. Now hold down Shift and hit F9. This will produce a top line that reads:

Get Block: track:sector.number (Esc to cancel) "A:702.18"

The cursor will be flashing under the A within the quotation marks. Using the same syntax, change the three parts of the last item to

"B: [sector number]. [number of sectors to read]"

On hitting the Enter key, the B drive will rumble into action and the long-lost data will come streaming into the new file on the screen. Remove the block markings by hitting F5. Remove the damaged disk from B, replace it with a good formatted disk; then save the precious stuff to the new disk with the usual save commands F1 and F3. Repeat the process, merging more data into the same file (at the cursor) or, playing safe by giving each file a different name until you see what data you get.

The last part of the block entry is given as 18. I have found that it is possible to pick up about 24 sectors at each swoop; although sometimes, the entire file will come tumbling in, up to the maximum length of PC-Write buffers, which is 64K. Repeat the procedure, using different sector numbers to scoop up proceeding or subsequent texts.

A well-used disk may have bits and pieces of files scattered among its sectors. When that is the case, it will be necessary to run the Norton search facility several times, in order to find all the different sector numbers where related data may be hidden. Finally, all the data will be found. The files can then be brought up in PC-Write or any word processor that uses or imports ASCII files, edited and re-joined as appropriate. Viola! Success, the crisis is passed and all is well once again.

What if the disk tool utility cannot access the disk at all? If the trouble is in the boot tracks, Norton will not be able to read or open the damaged disk at all. But PC-Write will do so using the procedure sketched above! However, since you do not know the location of the sought-after data, you will have to patiently explore the sectors. Estimate about where the file was on the disk, then plunge into the sector number at about that position. If it was somewhere in the middle, start at sectors in the middle (say, about 320). When a sector returns the right stuff, then search for the beginning and ends of the files. This process requires some patience and ingenuity, but it works. I have done this many times.

The data rescue capability revealed here deserves to be known and used widely. Both levels of data rescue can play important roles in salvaging crashed floppies (and will also work on hard disks, but the disk architecture is different), saving us from heartbreak and madness, and perhaps saving for the world some of our most fragile and magic moments of inspiration at the computer keyboard. ●


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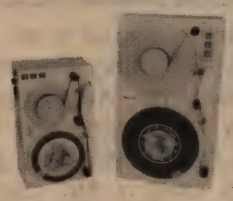

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The printer's setup features are presented to the user on a menu. After selecting the features the user wants, he types in a name of his choice. The user-defined name serves to identify the features as a group. The group of features can be recalled from a batch file or the DOS command line at any time in the future to be used again for printer setup. But of special interest is PRESET For Networks' semaphoring ability.

According to Rothschild, "PRESET For Networks ensures that the printer setups of multiple intervening network users do not conflict with one another. PRESET For Networks establishes a one-to-one relationship between your computer and each network printer. Your daily printing automatically conforms to the setups corresponding to the printers, but other users' printing on the same printers is not affected."

PRESET For Networks may be used concurrently by as many users as the network supports.

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For additional information contact Laser Age Software Co., 1831 Prosser Ave., Suite 204, Los Angeles, CA 90025. (213) 470-1397. ●

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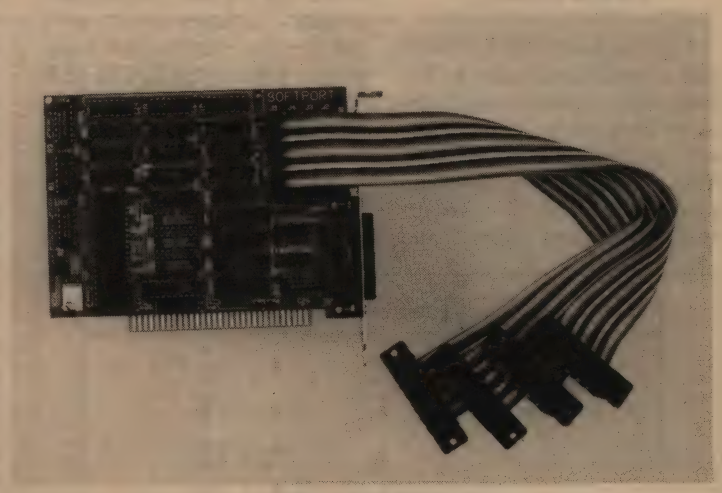

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The switching program can be run manually or incorporated in a batch file to automatically select the proper input/output device for a particular applications program. The pop up window can be used to switch devices when an applications program is running. The window displays the numbers of the ports to which the serial input/output devices are connected and allows selection of the port by entering the port number.

The price for SOFTPORT is $195. The cost is substantially less than the total cost for both a serial/parallel adapter and a mechanical selector switch. In addition to being less costly, SOFTPORT eliminates mechanical wear and provides the computer user with the convenience of automatic switching.

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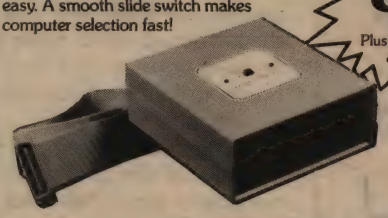

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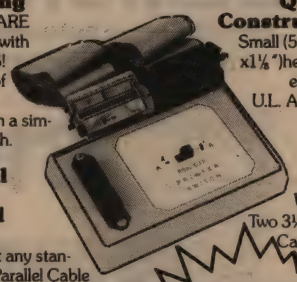

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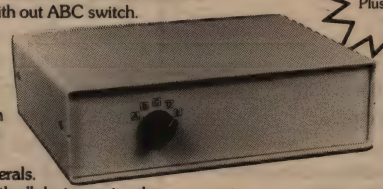

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**Quality Construction!**
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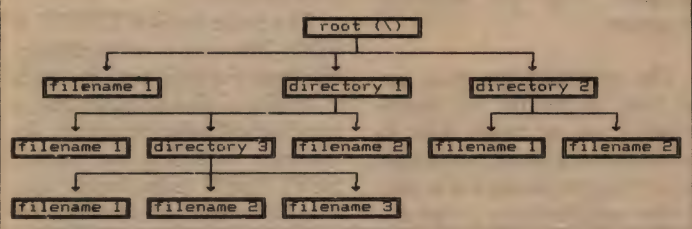
# A New And Fatter CHIWRITER Debuts

by Hal Nieburg

The original CHIWRITER was a terrific package, and it deserved to make news! *Computer Shopper* was one of the few publications to notice. Now a vastly improved version is here and richly deserves attention. A font editor and scientific word processor, available as freeware or, with full implementation, at a negligible price, CHIWRITER makes special symbols, mathematical formulas, and foreign language characters available on ordinary micros for average users.

CHIWRITER is a what you see is what you get full function word processor allowing editing with multiple fonts and super/subscripts right on the screen. Up to twenty fonts (almost 2000 characters) and unlimited levels of super and subscripts are supported. It allows frequent font changes, tables, and formulas from within ordinary word processing documents.

| Physical Quantity | Operator | Coordinate Form |
|---|---|---|
| Energy | $\hat{H}$ | $\hat{\mathcal{H}} = -\frac{\hbar^2}{2m}\nabla^2 + V(r)$ |
| Momentum | $\hat{p}_x$ | $\hat{p}_x = \hbar\frac{\partial}{\partial x}$ |
| | $\hat{p}_y$ | $\hat{p}_y = \hbar\frac{\partial}{\partial y}$ |
| | $\hat{p}_z$ | $\hat{p}_z = \hbar\frac{\partial}{\partial z}$ |




The program is easy to learn and use. The newest version provides a menu system paired with many keyboard shortcuts. Editing of formulas and diagrams is straightforward and quick. Files can be imported or exported to and from WordStar and other word processors, and standard spelling checkers can be used.

It is compatible with keyboard macro programs, and is not copy protected, installing easily on a hard disk. The included font editor permits existing fonts to be edited or new ones created. See some of its capabilities in Figure 1.

### Changes From Earlier Version

The new CHIWRITER (version 2.06) sports a great many new and more powerful features.

Now there is a Lotus-style menu on the bottom of the screen, which operates with a movable highlight bar, or (for experienced users) by direct keystroke combinations.

Cursor movements have been improved for multi-row lines. This program distinguishes "rows" and "lines" in order to make possible multi-tiered characters. Sub- and superscripts can go up and down any number of levels. Thus Horstmann has greatly improved the user's ability to move between rows within a single line.

In unsynchronized mode, Up and Down arrows move one row up or down, in synchronized mode one line up or down. PgUp, PgDn are slowed down in unsynch mode as well and then move by lines. Ctrl-PgUp and Ctrl-PgDn now move one row up and down and if the top or bottom of the current line is reached, a blank row is automatically inserted.

Tab and Shift-Tab now are used for tabs in proportionally spaced tables, although you can still use Tab in the ordinary way to indent a line.

Spacing is now exactly 6 lines per inch in single-mode (previously 0-spacing), lines per inch in one-and-a-half spacing (previously 1-spacing) and 3 lines per inch in double spacing (previously 2-spacing). Triple spacing (previously 3-spacing) is also supported, but the other combinations aren't any more. The spacing is selected through the "Layout Spacing" menu option.

Synchronization mode is now toggled by the Grey * key. Cutting and pasting in unsynch mode manipulates blocks areas of any size rather than linear text. You can cut out a small part of a formula and paste it somewhere else. The unsynch paste has a preview mode. The buffer is overlaid over the text and can be positioned with the cursor keys. Return inserts, Esc cancels. Word wrap is turned off in unsynch mode. You must switch back to synch mode when you are done with a formula.

More fonts. There are now up to 20 fonts simultaneously available to the user. The regular function keys (F1 through F10) switch the first set; while Shift-F1 through Shift-F10 keys switch the 10 additional fonts. The font name is now displayed in the status line.

Fonts which come already installed are Italic, Greek, Bold, Symbols, Script, Foreign, Gothic (Old English), Linedraw, Small, Math I and II, and Orator. Six more can be readily added at the users' discretion.

Some fonts have changed location, and the old "symbol" font has been greatly enlarged and expanded to become three fonts. FOREIGN automatically changes the keyboard for direct typing circuflexed and diacritical characters, not only those of French, German, and Spanish, as in the IBM system, but also Russian, Czech, Turkish, and much besides. LINEDRAW changes the keyboard into a mode that permits direct drawing of boxes, utilizing all the extended graphics characters.

Macros have been rekeyed because of the change in the command keys. Now key sequences can be attached to the Alt-1 through Alt-0 keys. All kinds of complex mathematical symbols can be evoked with one of two strokes.

The speed of search and replace has been improved.

Printing is the area of the most dramatic change. The draft fonts have been removed. The printer fonts have slightly increased in size and now there is enough space for true accents on top of capital letters.

Bold, italics and correspondence quality fonts of many printers are supported on sub-menus. Proportional spacing and micro-justification are available. The old Roman font has been redone in proportional spacing. The standard font has a plainer typewriter-like appearance. Elite (12 pitch) is supported if the printer has it. The HP Laser Jet (J cartridge) is supported.

continued on page 175

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**CHIWRITER Debuts**
**continued from page 174**

A wonderful footnoting system has been installed, placing an actual "foot" in the superscripted position, replaced by a consecutive number upon printing. The footnotes are entered into a separate buffer, with "separating" space or lines designed by the user.

Ctrl-N starts a footnote at the cursor location (or if there already is one, revises it). The footnote is printed at the bottom of the page. No wrapping around of long footnotes onto several pages, though. No endnotes either.

You can select the first page and footnote numbers to be printed. For example, if you start printing from the third page of the document and specify starting page number 10, the first printed page will be numbered as page 10.

Horstmann has greatly improved out-of-memory detection. When the program is out of memory, it doesn't kick you out any longer. It just refuses to execute any more commands that require more memory. You can still save your file, too.

Since the location of a number of fonts and characters has changed, a utility is provided to convert files from the old version. If you designed your own fonts on the old CHIWRITER, never fear. They can be quickly converted to run under the improved system.

**Anatomy Of A Line**

Each document consists of a sequence of lines. Each line ends in a marker which is displayed at the right of the screen. There are two types of markers, indicating soft and hard returns. Different lines can have different thicknesses depending on the number of super and subscript levels in it. Dashes in the return marker column indicate the sizes of the lines. Even single spaced lines can hold one superscript level which overlaps with the previous line.

Rows within a line can be added or zapped. To type in a formula or a table you will need several levels of superscripts and subscripts. When the cursor reaches the top or bottom of a line a Ctrl-PgUp and Ctrl-PgDn automatically inserts a new blank row. If you want to insert a row in the middle of a line, use Ctrl-A. The row is added immediately below the cursor. Then move the cursor onto the next level and add a few more levels with Ctrl-PgUp, Ctrl-PgDn, and Ctrl-A. When done, switch back to text mode (SYN).

To remove a level move the cursor into it and hit Ctrl-Z. Move the cursor into the formula below move the cursor to different levels with Ctrl-PgUp and Ctrl-PgDn, and zap rows to your heart's content, or delete the entire line by hitting Ctrl-Bksp.

Before writing a formula table or diagram most people prefer to first create a large number of super and subscript levels to obtain a large working area. Unused rows can later be removed with Ctrl-Z.

CHIWRITER files, with their complex printer instructions, take up about a modest 20% more disk space than comparable ASCII files. Text buffers can hold single-file documents up to 187K (that's 141K ASCII) in length, and can load or write-to-disk such large size documents in acceptable time-spans (about 70 to 80 seconds). Smaller documents take proportional fractions of time. Users thus must pay in speed for the power of the program.

The price of the new release is $79.95. The "Pirateware" version is $9.95 from the author, who uses the latter term to distribute a full working copy of the program without the Font Editor. A freeware demo copy is also available.

Special printer extensions, additional pre-configured fonts, and printed documentation are available at equally reasonable cost: Toshiba, Hercules Monochrome Board, EGA High Resolution support are each $19.95; HP Laser Jet Laser or Jet Plus support are $49.95 each; Font Pack #I is $19.95; program update from registered users is $9.95; the manual is $19.95.

For more information contact Horstmann Software Design, P.O. Box 4544, Ann Arbor, MI 48106; (313) 663-4049. ●

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What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

### Specifications

| | |
|---|---|
| Print Speed | 36 CPS (Shannon text) |
| Print Wheel | 96 petals/wheel, cassette type, ASCII stand. |
| Print Wheel Life | 10 million char./wheel |
| Characters/Line | 132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15") |
| Paper Width | 16.5 in max (419 mm) |
| Copy Capacity | Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.) |
| Carriage Motion | Bidirectional, logic seeking |
| Carriage Rtrn Speed | 750 ms (at 13.2" return) |
| Line Spacing | 6, 4, 3 lines/inch, 1/48" proportional increments |
| Paper Feed | Bidirectional, logic seeking |
| Paper Feed Speed | 4"/second |

| Available Ribbons | Ribbon Life |
|---|---|
| Single-strike black carbon film | 60,000 |
| Multi-strike black carbon film | 150,000 |
| Single-strike black correctable film | 70,000 |
| Multi-strike black fabric | 500,000 |
| Single-strike red film | 2,000 |
| Correction tape | 1,500 |

| | |
|---|---|
| Interface | Standard RS-232C – Serial |
| Buffer Size | 7K |
| Control Panel | Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs)<br>Switches: Select, Line Feed, TOF, Line, Pitch, and Copy |
| Noise | Operating – Less than 65 dB |
| Temperature | 50 to 105 F – 10 to 40 C (operating) |
| Humidity | 20% to 80% non-condensing (operating)<br>5% to 90% non-condensing (storage) |
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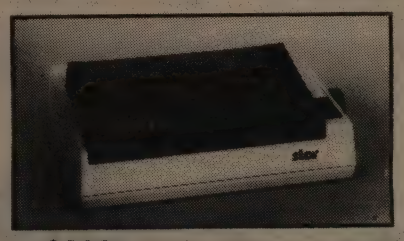

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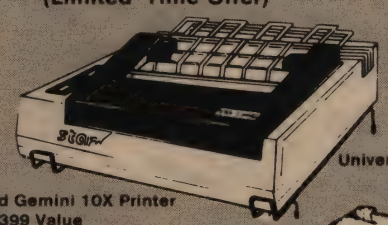

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# Central Point Software's Copy Board

by Dr. Michael W. Ecker

Besides the Zuckerboard, I have one other occupied slot in my Tandy 1000, and I am glad it is occupied with Central Point's Copy Option Board.

For those of you who don't recognize the company name, Central Point Software is the company which is the leading seller of products designed to copy software which has been copy protected. Several publishers in the last few months have announced the intention of removing copy protection, including such notables as Ashton-Tate, Javelin, and Ansa Software (maker of Paradox), to name just a few. Nevertheless, some players seem determined to maintain the protection as long as they feel there is a piracy problem and that users will continue to support them in spite of it. Most notable in this bunch is Lotus Development Corp. with its stance on 123 and Symphony.

Without making any judgment on the other side (I am a software consumer as well as a software publisher, although my company doesn't copy protect), I note that as long as there is copy protection, there will remain a market for unprotected products.

The leader in the latter market, Central Point Software, has recently upped the ante in its line of backup-enabling products by producing a hardware card. The Copy Option Board, selling for under $100, enables users to reproduce more software than previously possible with software solutions alone, such as with Copy II PC. At the same time, Central Point is scrupulously careful to employ language discouraging piracy and stressing the lawful use of the company's products.

I obtained two units of the board, one for IBM and many PC line products, and one with an additional cable for use on a Tandy 1000. I did all my testing on the Tandy 1000, and expect results to be comparable on any PC, XT, AT, or compatible. As now sold, the unit is ready to install in a PC, but Compaq and Tandy 1000 owners must change a few jumper settings on the board, notably for a DMA jumper set and another set marked IBM on one side and Compaq on the other (making the setting obvious). Tandy owners also need to do one cable switch due to the extra cable, but such detail is clearly presented in the manual and addendum, collectively an adequate forty pages.

The instructions specify about 30 minutes for installation, but it seemed like a lot less to me, even though I'm no technician. In fact, a Tandy owner could read the one-page addendum (just for Tandy) alone and install from it, which is precisely what I did and perhaps why it didn't take much time.

The card itself is a half-card, and you are free to use any slot, provided the attached cable can reach your disk drives. Briefly, here is what you do: You open up your computer. You unplug the cable connecting your disk drives to the motherboard, the unplugging being along the drive portion. You connect this cable's now free end to the card instead, and then use the cable already on the card to attach to the motherboard. Then you insert the card into a free slot. In other words, the card is an intermediary between the disk drives and motherboard now. In the case of the Tandy 1000, the original cable is too short to reach the card, so it is replaced by the longer cable, and the procedure is just a bit different. Tandy users have to be careful to note as well to reverse the cables attached via the J2 and J3 connectors, too.

After you've reassembled your computer, you are ready to test. For this, you need the accompanying disk. Unlike Copy II PC, the program TC offers more options and parameters. Even better, you don't have to memorize the options, since you get a full menu. Simply type TC from DOS, or TC/C1 for Tandy and Compaq. I confirmed the addendum's warning that a Tandy will not be able to use the board if you omit the "/C1" portion, needed to address the correct DMA on the card.

Central Point claims not only that most programs can be copied, but most can be copied using the default settings on the menu. To test the card, I picked a few programs which were completely unprotected, a few which were protected but which could be copied by Copy II PC alone, and, the most important part, a few programs which I had previously been unable to backup at all. Generally, programs unprotected copied easily, and I did this test just to see whether the board had any anomolies. I then jumped to the other extreme. First handy program was Number Master, a drill/ learning program in education which I reviewed in the Sept. '86 *Computer Shopper*. Number Master is well protected and I had been unable to reproduce by any other means, including Copy II PC. TC made the copy, veri-

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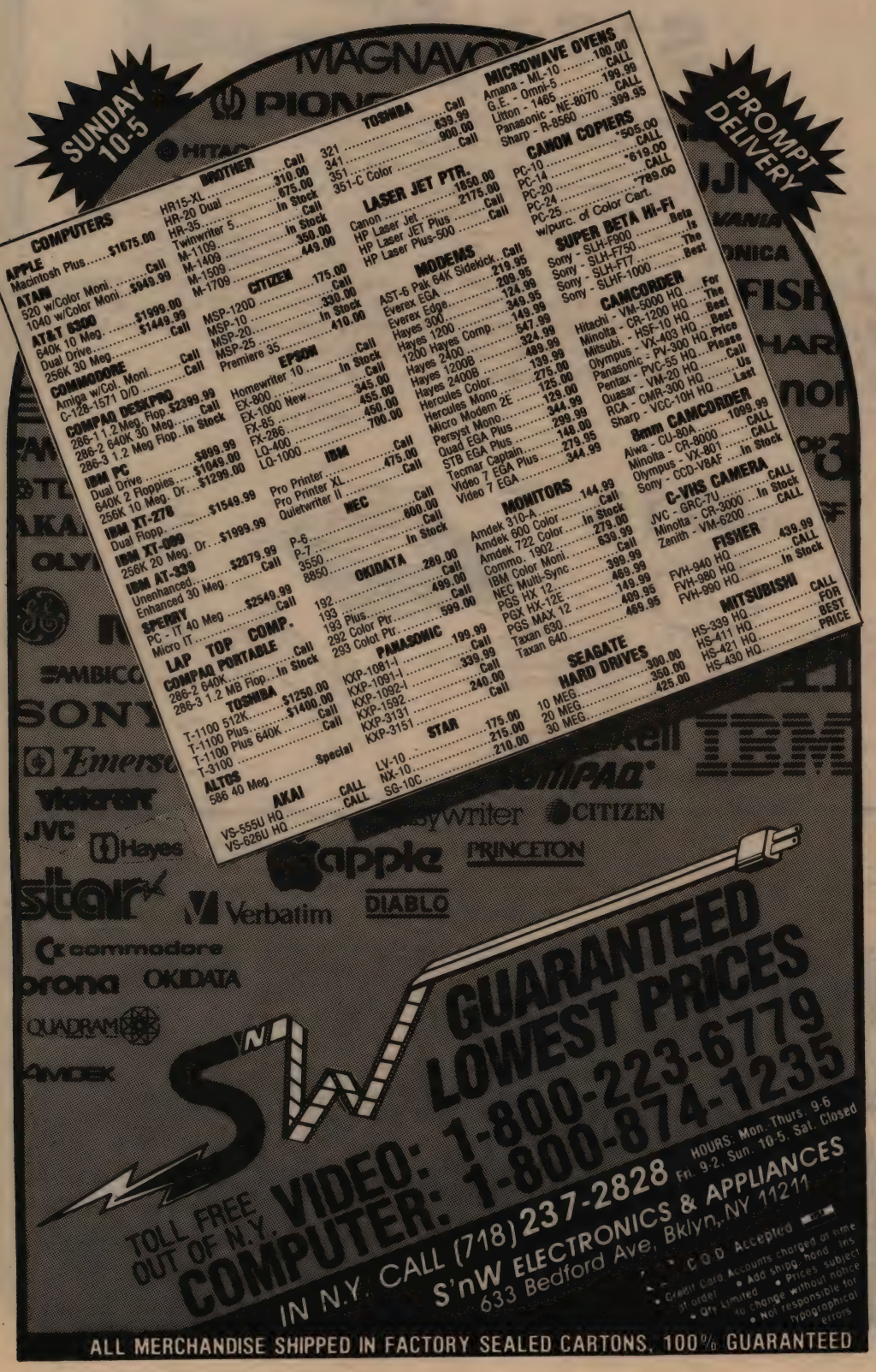



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# Stylewriter Adds Letter Quality Hardware and Software

by Dr. Michael W. Ecker

Just as you probably did, I'm one of the many who purchased dot matrix printers but am now interested in upgrading to better print quality. For us, there is an alternative to buying a letter-quality printer, although laser printers may still be out of our price range. Whether or not we in fact would wish the alternative is a highly debatable matter, however—and the subject of this next review as well.

For those interested in a less expensive upgrade alternative, Microphonics Corp. offers its Stylewriter in three versions, depending on printer. What is it exactly? It's a hardware interface between your computer and dot matrix printer designed to add letter quality or near-letter quality for owners of Epsons, IBM printers, and C Itohs. My review deals strictly with the C Itoh, but it appears that I had the printer which needs the improvement the least, thus benefiting me the least. The results appear to be more positive and most dramatic for the earlier Epsons, such as the FX-80s, many of which are still in people's home and small businesses.

Were it only for the quality of the formed letters, the Stylewriter unit might have less appeal, but it also offers multiple typestyles through font chips. A maximum of six chips is possible in the unit at any one time, although the number of chips available from Microphonics is greater than this. The hardware also includes a built-in buffer with 8K to 128K offered, a very nice extra feature. Considering the combination of print quality, multiple fonts, printer buffer, and savings, the unit has appeal. Furthermore, in view of your retaining your dot-matrix printer, you also retain the graphics, double-sized letters and so on you would lose if you switched to a daisywheel printer. Having just purchased a daisywheel printer, I find myself often going back to my Prowriter for other such uses.

Perhaps the most dramatic element is that Stylewriter, while dependent on the choice of printer, operates almost independently of the choice of computer you use, with the word processing program or software remaining your choice. I say "almost" because I had some small problems. I also found that you have to deactivate some of your word processor's own commands. More in a moment.

The unit I reviewed contained four font chips already installed, plus a 64K print buffer. This configuration is not standard, as two is the number of fonts provided as sold, although you may select which two without extra cost. The 64K buffer may be standard, although I saw one reference to 8K as the standard. A prying tool is included to facilitate removal of extra font chips. To add or remove chips, you use a Phillips screwdriver on two small screws to get into the unit, which looks much like a buffer externally.

The Stylewriter comes with its own power supply (essentially an AC adaptor) and cable, as well as small operations manual and supplementary page on typestyles. Attaching it is easy: just attach your computer's printer cable to the unit, and the supplied cable from the unit to your printer. So, the Stylewriter not only looks as a buffer does, but is an intermediary hooked up in the same manner as an ordinary buffer. Unlike an ordinary buffer, there seems to be no way to make multiple copies. Presumably, you would photocopy rather than make more copies anyway, but it might have been nice to be able to make more copies through the buffer under some circumstances.

In terms of quality output, which is probably the most important factor, I found the change clearly noticeable in the NLQ mode—the mode for which the unit is designed. (You would turn it off only if you needed a rough draft.) Of the four fonts available, I particularly liked one with larger characters, for which the quality was good, in my opinion. However, this view was not unanimous, as my wife thought that the characters produced looked too dark, thick, and/or heavy. This was even more true of the fonts with the smaller point sizes, and was unarguably true of the inverse printing, with the letters of white on small rectangular black background coming out too small.

Whether you like the results or not, there is one huge disadvantage as long as the unit is attached and in NLQ mode: the unit is painfully slow, making as many as ten passes at a single line if the line is long. In view of this, the buffer has to be regarded more as a necessity than a luxury, although there is no denying that the buffer is nice to have in any case. It appears that you can get most of your speed back if

continued on page 186


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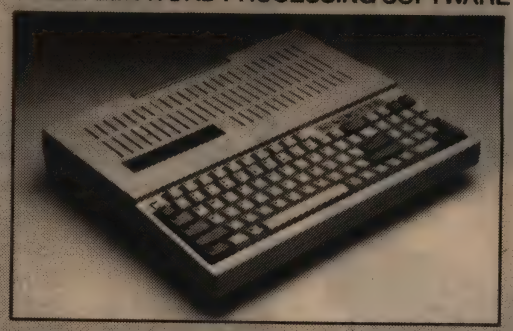

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# Toolkit for Framework II Developers

Ashton-Tate has introduced a Developer's Toolkit for Framework II.

The product, announced at Ashton-Tate's Developers' Conference, is a collection of routines and programs designed to aid developers in writing faster and more efficient custom applications using Framework II's FRED development language.

The software provides Framework II developers with the tools to create and customize printer drivers, create new import and export file utilities, maintain and use dBASE files (.DBF) from within Framework II and develop computer-based training materials. Also included are more than 20 user defined library functions designed to provide shortcuts to writing routines.

Example applications and routines with documented source code are included to illustrate each utility. Additionally, the kit contains previously undisclosed documentation of the Framework II assembly/high-level language interface to provide a link between Framework II and the native capabilities of the personal computer.

The package, which contains two disks and a reference manual, will be available in the fourth quarter at an introductory price of $99.95. The suggested price is $149.95. To order, call 1-800-437-4329.

Hardware requirements are an IBM PC, PC XT, PC AT, 3270 PC and compatibles with 384K bytes of RAM and two 360K byte floppy drives, or a single 360K byte floppy and a hard disk. Both color and monochrome monitors are supported. The utilities may be used with Framework II version 1.0 or 1.1.

Version 1.1 upgrades are available to registered Framework II owners for $45, if the software was purchased prior to July 5, 1986. Products purchased after July 5 will be upgraded at no additional cost. For further upgrade information call 1-800-2-ASHTON.

Framework II, Ashton-Tate's integrated software product, combines a word processor and spreadsheet with ancillary graphics, file management, and communications capabilites.

Its FRED programming language permits the development of specialized applications.

For more information contact Ashton-Tate, 20101 Hamilton Avenue, Torrance, CA 90502-1319; 213-329-8000●

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See details on page 52.

# dBASE Programmer's Utility Package

Ashton-Tate, the second-largest developer and marketer of microcomputer applications software, has announced dBASE Programmers' Utilities, a utilities package for dBASE programmers.

The package contains more than 35 dBASE and 12 DOS utilities designed to aid dBASE developers in performing functions such as repairing and recovering damaged dBASE files, creating dBASE screen and interface designs, structuring and cross referencing command files and controlling communications and parallel ports from within dBASE.

The DOS utilities enable users to manipulate files and subdirectories, perform rapid disk searches, change file attributes and use a screen clock.

The package is a compilation of utilities developed by dBASE experts Robert A. Byers, author of the best-selling book, *Everyman's Database Primer*, Jeb Long, Ashton-Tate chief technologist and C. Wayne Ratliff, developer of dBASE II.

The package is available at computer retail stores and bookstores nationwide or through Ashton-Tate's toll-free number (800) 437-4329. The suggested retail price is $89.95.

"This package is particularly valuable because it provides programmers with a variety of useful tools all assembled into one software package," said Lawrence Benincasa, vice president, Ashton-Tate publications. "The utilities included are personal favorites of the package's developers and have proven to save them time in writing dBASE code."

Hardware requirements are an IBM PC, PC XT, PC AT or compatible computer with 384K of random access memory and MS-DOS version 2.0 or higher. The utilities are for use with dBASE III PLUS and all versions of dBASE III, including the dBASE III Developer's Release.

dBASE III PLUS is Ashton-Tate's relational database management system for the IBM PC and compatibles. dBASE III PLUS LAN Pack is a network-only version of dBASE III PLUS.

The company also markets MultiMate word processing software, and Framework II, an integrated software package. Ashton-Tate's Publishing Group markets books and software add-ons for its major software products. The company has also signed a letter of intent to acquire Decision Resources, Inc., developers of the best-selling MASTER GRAPHICS Series of business graphics software.

For more information contact Ashton-Tate, 20101 Hamilton Avenue, Torrance, California 90502-1319, 213-329-8000.

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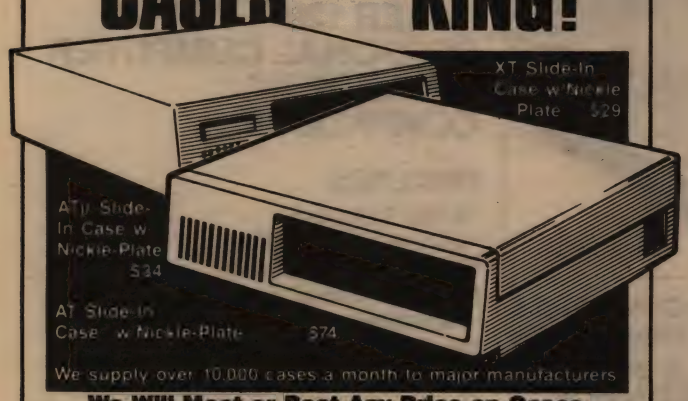


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# Network Version of Microsoft Word 3.0

Microsoft Corporation is shipping a new network version of Microsoft Word that incorporates all of the features of Microsoft Word Version 3.0. Many of Version 3.0's new capabilities, such as outlining, indexing, and expanded support for laser printers, are particularly useful in the local area network (LAN) environment.

The network version of Microsoft Word 3.0's fully integrated outline processor allows users to generate an outline, write the document from the outline, and then transmit either the outline or the document over the network. For example, a committee head can send the agenda for an upcoming meeting to committee members over the network in outline form. Following the meeting an annotated outline based on the meeting results can be transmitted as a full report.

The full document may be conversely condensed to an outline version. Moreover, any network user can easily zoom in on any part of the condensed document and expand it to the full text. Any changes made in either the outline or the document itelf (e.g. heading changes or text order) are automatically incorporated into the other version.

In addition to special features such as file-locking and print-spooling, the new version of Microsoft Word for Networks offers several unique features which are useful in a networked PC environment, such as hidden text. Text designated as "hidden" may be displayed or not and printed or not, according to the user's wishes. For example, when a document is sent over the network for review, the reviewer's comments can be designated as hidden. After the appropriate text changes are made, the hidden text can be "erased" before printing.

An obvious benefit of networking is the ability to share expensive peripherals. The network version of Microsoft Word 3.0 supports over 70 different models of printers, including more than 16 types of popular laser printers. In addition, this new version can download multiple fonts to many laser printers without the need for more software. This capability gives any member of the network easy access to professional-quality business documents.

The professional appearance of business documents is also greatly enhanced by style sheets, another feature that is very applicable to the network environment. Style sheets not only ensure a professional, consistent "corporate look," but they also save the individual user the effort of formatting each document. Once saved as a style sheet, the proper format for letters, memos, reports, and budget documents is accessible to every network member.

Finally, all basic Microsoft Word features are explained and demonstrated in an online, context sensitive, computer-based training program that is suitable both for single users and for group training. In a networked environment, this can significantly reduce the hours necessary to train, for example, a group of new clerical staff members.

The network version of Microsoft Word 3.0 is for use on IBM PCs and compatibles. It requires a file serve with hard disk and one double-sided disk drive. For each workstation, 256K memory is required (320K recommended).

Supported networks include common PC networks such as the IBM PC Network, IBM Token-Ring Network, 3Com 3Plus, 3Com EtherSeries, Novell NetWare, and all systems compatible with Microsoft Networks.

The network version of Microsoft Word 3.0 is shipping now. It may be ordered in two configurations: the Network Version Software Master Pack (software, one set of manuals, and one network administrator's guide) at the suggested retail price of $750 each, and individual Network Version Workstation Packs (one complete set of manuals) at the suggested retail price of $150 each. This new configuration will allow corporate customers to purchase exactly the number of packs needed now and additional ones only when necessary.

Users can update from the network version of Microsoft Word 2.0 (5 pack) for $200. Additional update opportunities are available from single user versions of Microsoft Word.

For additional information contact Microsoft Corp., 16011 NE 36th Way, Box 97017, Redmond, WA 98073-9717. ●


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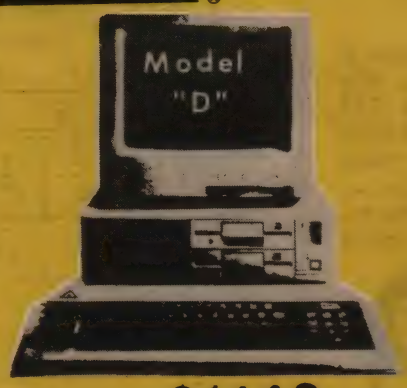


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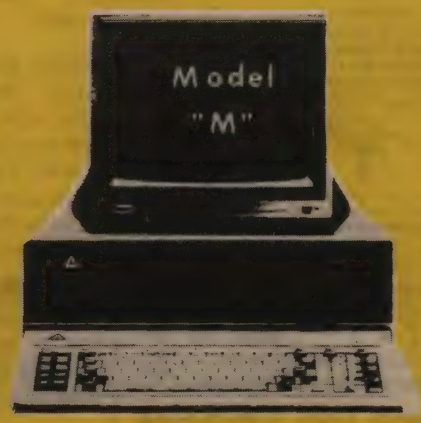


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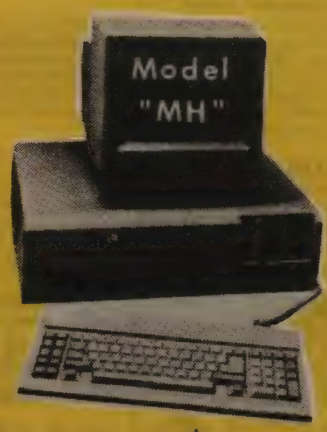


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# Expanding Memory For TelePC Computers

by Robert Wright

This article describes two methods by which a full 640 kilobytes of RAM memory may be easily installed and supported on the main logic (mother) board of a TeleVideo Systems, Inc. TS1605 series PC compatible computer.

### Background

The TeleVideo TS1605 series machines, called the TelePC, are a group of PC compatibles which cram onto the motherboard a color graphics adapter, a serial port (COM1), a parallel port (LPT1), and a floppy controller. The machine also includes on the motherboard some of the interface logic necessary to support a hard disk drive controller internal to the unit, and in fact these systems usually include two 360K floppies or one 360K floppy and a ten or twenty megabyte hard drive.

The machines were an early entry into the PC compatible market, and most of the first production units contained 256 kilobytes of RAM memory provided in 64K bit (4164) DRAM integrated circuits (ICs), or chips, installed in sockets on the motherboard. The original machine could be upgraded to 512 kilobytes of memory by merely removing all of the 64K chips from the four rows of sockets and inserting 256K bit DRAM ICs into the bottom two rows of sockets, adding a 74LS158 multiplexer IC into the empty socket at position U60, and moving the three plugs from the jumpers labeled E10, E11, and E12 from the top pair of pins in each triplet to the bottom pair of pins in the same triplet. Note that this then leaves the top two rows of the memory array sockets unoccupied.

However, as the machine is designed, increasing the memory size beyond 512 kilobytes requires the addition of a memory card in the single expansion card slot. Obviously this limits the use of the expansion slot to an "only this or only that but no way both" choice of uses for the machine.

If you are "missing the memory" to run some byte hungry big boy program a solution to the problem is within easy reach.

### Theory

As you might imagine, putting all of the logic contained on the motherboard of a PC machine in addition to the two ports, the floppy controller, a graphics adapter, 512 kilobytes of RAM, and interface logic to support a Western Digital WD1000 type hard disk controller on a single reasonably sized board required a certain amount of ingenuity in its implementation. TeleVideo chose to "compress" a certain amount of the logic required by placing it within custom integrated circuits.

One such circuit is used in part to decode the four high order machine address bits into enabling signals for the gating of the system's four RAS and four CAS signals to the four possible rows of memory ICs corresponding to a particular memory location. As may be seen from the partial logic diagram shown in Figure 1, the four inputs to the custom IC at location U50 on the motherboard are chosen from among the top four system address bits by the placement of the three previously mentioned jumper plugs.

Examination of the custom circuit's performance for the two nominal alternative choices in complements of

continued on page 183

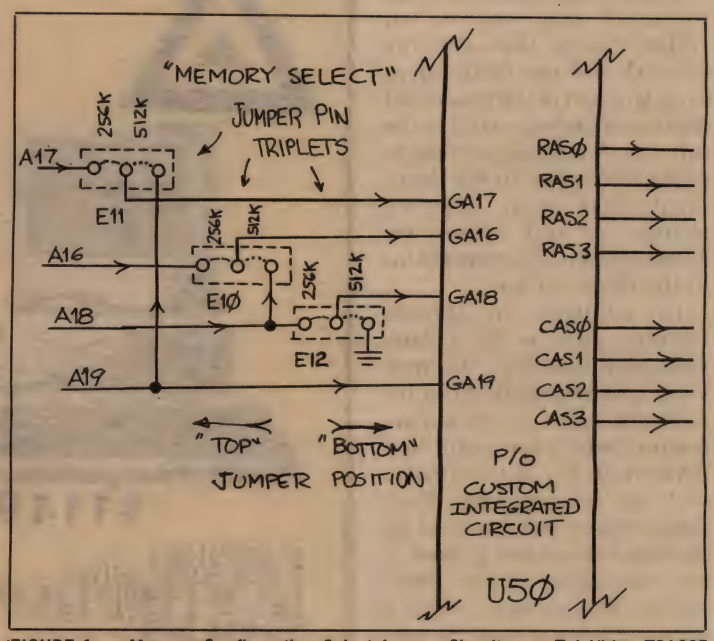


FIGURE 1 — Memory Configuration Select Jumper Circuitry on TeleVideo TS1605 Mother Board.


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**Expanding Memory**
**continued from page 182**

memory IC types yields the result shown in Figure 2. Note that for the analysis to be effective in determining the nature of the internal operation of the circuit, it is necessary to consider only the set of RAS signals or the set of CAS signals, not both. For our purpose looking at both would add an unnecessary level to the class of the state machine. Also notice that the fabled fortune cookie of fate has cracked in our humble favor insofar as the ease of circuit analysis goes because the four input signals (A16, A17, A18 and A19) correspond nicely to the four rows of sockets and the associated RAS and CAS signals.

Assume that the machine is presently set up for 512 kilobytes of RAM. We must then leave the 256K bit DRAM chips in the bottom two rows because these two rows are provided with the extra multiplexed address pin driven by the multiplexor (74LS158) installed at position U60 while the top two are not. Given the information in Figure 2 we may observe that the top two rows of sockets in the memory array may be provided with the appropriate RAS and CAS signals if the four high order address bits are "translated" as shown in Figure 3 before being input into the memory decoder circuit. Of course all of this presumes that the other signals to or from all of the memory IC sockets continue to be activated correctly, and in the TelePC this is true.

**Circuit Realization Possibilities**

A schematic diagram for a logic circuit to accomplish this translation and the locations of the necessary connections and modifications to the existing circuitry are shown in Figures 4 and 5. Observe that all three of the jumper plugs previously at E10, E11 and E12 are completely removed with this implementation and that 64K bit (4164 or equal) DRAM ICs are installed in the top two rows of memory sockets. The required modifications are easily performed by a competent technician.

If you are not a Doctor Smock or a reasonably good hardware type and the idea of cutting traces and adding wires onto the logic board of a computer doesn't suit your fancy, or you need to be able to return the computer (easily) to an unmodified condition, perhaps for maintenance, there is another possibility. Standard Data Systems, Inc. of Marietta, GA, manufactures an adapter, or daughter board

**continued on page 184**

| High Order Address Bit Values | | | | Gate Array Input Pins (256K Mode) | | | | Gate Array CAS and RAS Output Pins | | | | Gate Array Input Pins (512K Mode) | | | | Gate Array CAS and RAS Output Pins | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 18 | 17 | 16 | 19 | 18 | 17 | 16 | 4 | 3 | 2 | 1 | 19 | 18 | 17 | 16 | 4 | 3 | 2 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |

FIGURE 2 — Memory Address to CAS and RAS Enable Signals from Gate Array. Note that the numeric pin designations are logical, not physical, pin numbers.

| High Order Address Bit Values | | | | Translated Gate Array Input Pins | | | | Gate Array CAS and RAS Output Pins | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 18 | 17 | 16 | 19 | 18 | 17 | 16 | 4 | 3 | 2 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

FIGURE 3 — Translated Memory Address to CAS and RAS Enable Signals from Gate Array. Again, pin numbers are logical, not physical, designations.


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**Expanding Memory**
**continued from page 183**

which they call the MAXI-MEM TV640 that plugs into the existing custom IC's socket on the motherboard and this custom IC is then plugged into a socket on the MAXI-MEM adapter board. The adapter board of course contains the translation circuitry just described but in an easy to install form. To install the modification in this case entails only moving the three jumper plugs to the top position, installing the 64K bit DRAM chips, and installing the daughter board as described between the memory controller IC and the motherboard. As might be expected, the adapter board is physically small, 1.9 x 2.6 inches in size.

### Conclusion

Either approach offers a method whereby the useful memory size for the TelePC computers may be easily increased to the nominal MSDOS maximum of 640 kilobytes on the motherboard, leaving the expansion slot free for other purposes.

The MAXI-MEM TV64C card sells for $89.95 including 128 kilobytes of RAM and $69.95 without the memory chips, plus shipping and handling. The MAXI-MEM card is available from Standard Data Systems, Inc. of Marietta GA; (Telephone 404/973-0087) or from Inovatek of Fremont, CA; (Telephone 415/490-5162), the West Coast Distributor. ●

**WARNING**

**This modification requires circuit modifications which may damage your computer if done incorrectly. Neither the author or *Computer Shopper* are liable for any damage done in installing this modification. Unless you are familiar with soldering on PC boards do not attempt to do this work.**

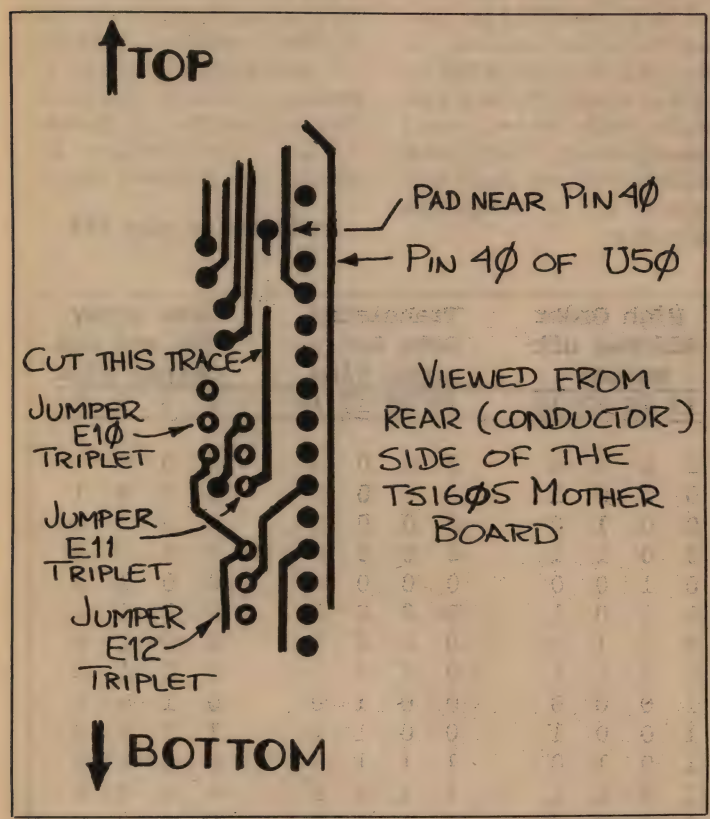


FIGURE 5 — Locations of Circuit Connections and Modifications. Especially note the locations of the "Pad near Pin 40" of IC **U50** from which the **A19** signal is obtained.

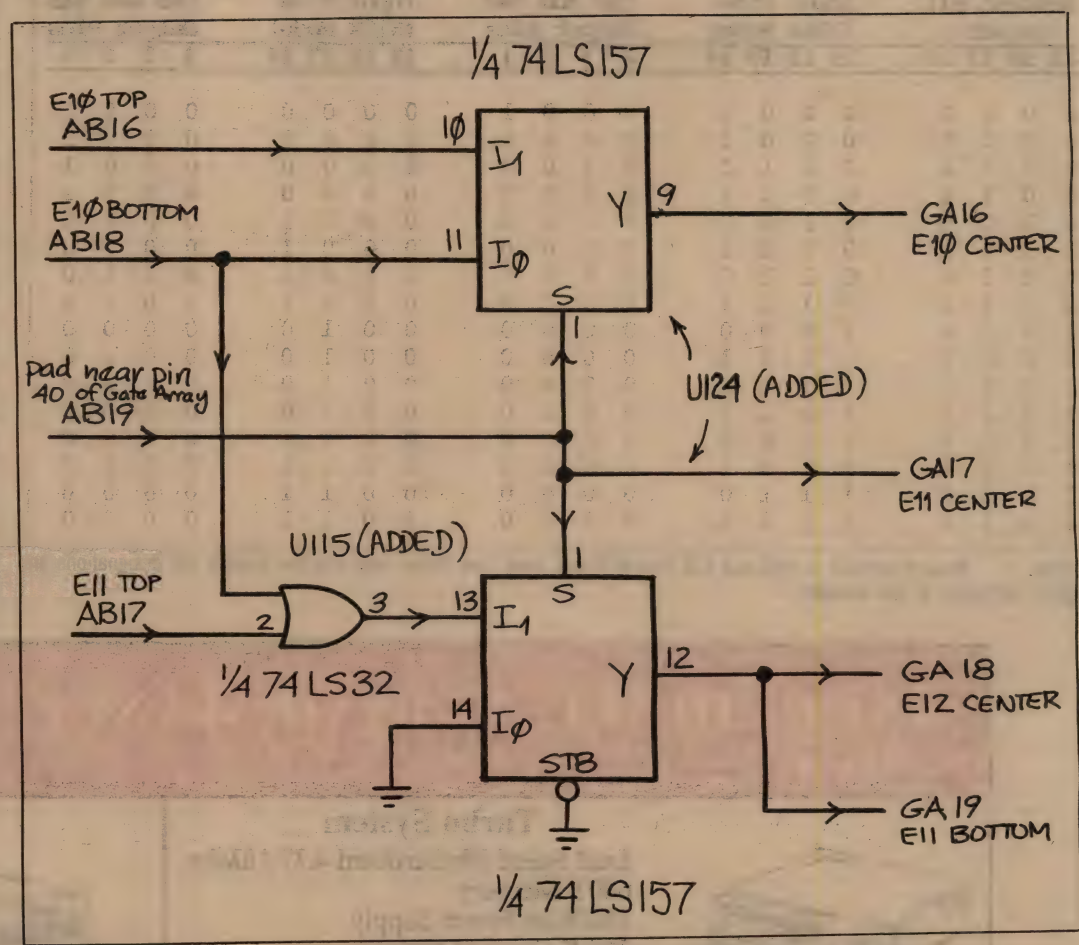


FIGURE 4 — Logic Diagram of Translation Circuitry for TS1605 Memory Expansion.


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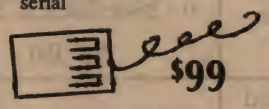


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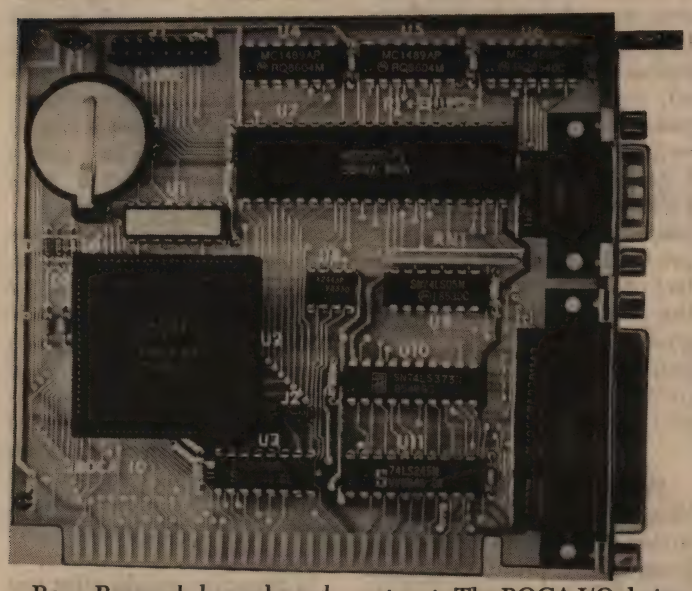

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The BOCA I/O for the IBM PC/AT and compatibles includes a parallel printer-port; a high-speed (50-9600 baud) serial communications port; and optional game port.

Installation is simple because there are no jumpers or switches to set. The BOCA I/O design is centered around a custom VLSI chip which is used for I/O address decoding. Ports are fully addressable via the BOCA I/O configuration program which customizes your configuration and stores it in Electronically Erasable Programmable Read Only Memory (EEPROM). Each time you power up your BOCA I/O configuration is in place. The BOCA I/O package includes installation software or diskette.

The BOCA I/O is available immediately through dealers at a suggested retail price of $129 for the PC and XT version and $119 for the AT version. It is covered by a one year warranty. For more information contact Boca Research at 6401 Congress Ave., Boca Raton, FL 33431; or call (305) 997-6227. ●

# Sweet-P Plotter Manufacturer Introduces CAD Plotter

Enter Computer, Inc., San Diego based manufacturer of Sweet-P Desktop Plotters and TYP-SET Lettering Software, announces the introduction of a Computer Aided Design (CAD) wide-bed plotter for use with PC and other computers that, at $3,995, according to the company, contains high performance features found in plotters often costing more than twice its price.

Continuously adjustable for paper sizes A to D (metric sizes A4 through A1), the SP1000 is compatible with HPGL (Hewlett-Packard Graphics Language) and is capable of being used by a nearly unlimited number of PC-based software design packages, such as AutoCAD and VersaCAD, according to Enter Computer's vice president of Marketing, Bob Curtis.

The SP1000 uses servo motor operation for high-speed (24 inches-per-second), accurate, and quiet operation on standard ANSI, ISO or architectural size bond, vellum or film media.

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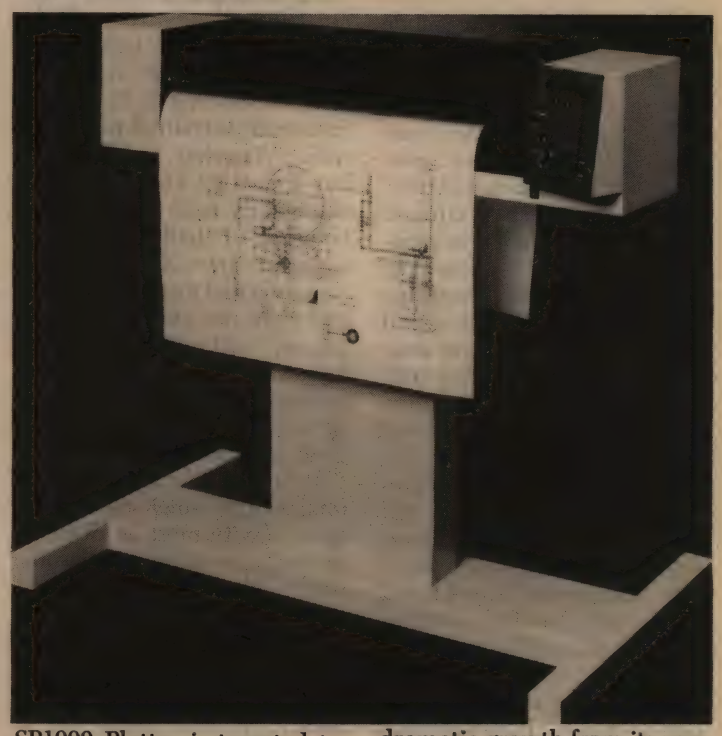
Designed and manufactured by Enter Computer, in the United States, the single-pen



SP1000 Plotter is targeted to the PC-based mechanical CAD, AEC (Architectural, Engineering, Construction), education and scientific markets.

Enter Computer expects dramatic growth from its new plotter, which is the first in a line of products aimed at the PC CAD workstation market. Enter Computer, 6867 Nancy Ridge Drive, San Diego, CA 92121; 619-450-0601. ●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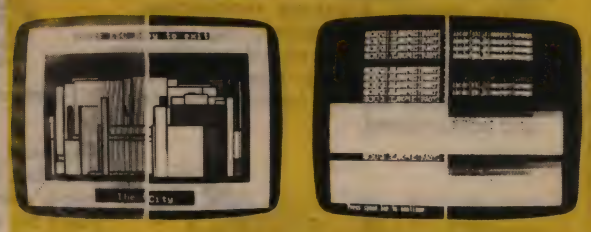

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**Stylewriter continued from page 179**

you turn off the quality mode and just use the unit as a buffer, but I did not test this feature.

The Stylewriter takes over printing throughput and controls all appearance attributes. Thus, you must acclimate yourself to what is a new mini-system. While Stylewriter does not control word processing functions of insert, delete, and word wrap, it does take over all appearance attributes, such as pitch, typestyle, left and right margins, centering, underlining and double underlining, bolding, and proportional spacing with full justification. Those who have word processors with fewer such features will enjoy these, particularly the full justification, but many of us have most of these features already anyway. That is not the question so much, however. You see, you don't really have much choice: Stylewriter takes so much control that it prevents you from using your word processor's features, because they interfere with the unit.

For example, I tested with my 640K Tandy 1000 IBM-compatible using two word processors: first LeScript, and later Volkswriter 3. The latter produced real output problems with Stylewriter, so I gave up, but I did get the former to work fairly well. In so doing, however, I had to remove LeScript's own commands for centering and justification, left and right margins, and a few others, and instead imbed Stylewriter's. Failure to do so produces undesirable results, something which the manual gives no warning about.

It is precisely Stylewriter's total control which allows it to operate with most or all computers with most or all software. The hardware recognizes commands toggled on and off via the backslash (\) key followed by a code letter such as C for center or J for justify. If you follow by a number, Stylewrite recognizes this as a command to access a different font, and you can mix and match styles within one document.

In terms of the performance, Stylewriter functioned pretty well, as I noted above, but only after experimenting with character line width, choice of font, and choice of margins. Yet, the results were still not quite perfect. In a small document which I had set up well, the fourth line's first character consistently came out on the printout one character to the left of the left margin. I did not determine the cause, and the manual had little or nothing in the way of troubleshooting. I also could not get Stylewriter to print out its font pac list correctly via the \? command, as the lines printed out superimposed over each other, as though there were carriage returns without line feeds. This perplexed me, because I did not really have any other such problems in actual practice (one would not print out such a list on his document anyway). It's no big deal, but it is surprising.

Microphonic's hardware product may not be machine-specific or software-specific, but the choice of printer matters a lot. To accomplish what it does, it must not only take over control, but it must do so by overriding many printer dip switch settings—or so it seemed. Regardless of whether I locked on proportional spacing or draft 10 characters per inch, I got the same results. Once LeScript's printer driver was loaded initially, changing the printer driver setting had no effect on Stylewriter. I just wish the manual, which is fair to good, had more fuller examples and suggestions—not to mention the phone number and address of the company!

### Summary

With both advantages and disadvantages to getting a Stylewriter instead of buying a letter-quality printer, there are many "if"s to a purchase decision. Just as add-in accelerator cards are marketed as an inexpensive alternative to upgrading to a computer with a faster microprocessor, so does Microphonics position its printer add-on with buffer and choice of typestyles as an alternative to buying a better printer. However, with the price of letter-quality printers coming down all the time, Microphonics' advantage is being rapidly eroded, particularly given some of the shortcomings I've indicated. Of course, with the Stylewriter, you may continue to use your existing system and not have to get involved with new printer ribbons, wheels, cables, and installing new drivers for your word processor(s). Plus, you can install additional font pacs and obtain easy software-driven (by the \ commands) choices of typestyle. In comparison to other font products, there is no need ever to leave your word processing document and then work on the text. And, of course, you still do save money over a new printer ($229 for Stylewriter vs. $300 to $2000 for a typical quality printer). Plus, with a built-in buffer, you save another $100 plus or so.

On the other hand, the tradeoff is to learn some new commands to allow Stylewriter to function properly and optimally. My personal reaction is mixed, partly on account of the small problems I encountered, and partly by virtue of the increasing competition which is making letter-quality printers, daisy wheels, lasers, and so on, so much more affordable.

I therefore would offer just a modest to moderate recommendation, but with the caveat to try to locate a dealer who handles this and will allow you a test run first to see whether Stylewriter meets your needs, not to mention being sure there is compatibility with your dot-matrix printer. At the least contact the company for sample output and quality to expect for your particular printer.

Stylewriter, for any computer with parallel printer port and many printers, $229 (you'll need to check first about printer version); comes with two fonts; others $19.95 extra.

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# Mite Goes Public? Freeware Release of Mini-Mite

by Charles Miller

If you see a copy of Mite circulating around your user's group or on your favorite bulletin board—don't panic—its all probably perfectly legal if it is Mycroft Labs' new Freeware release of Mini-Mite.

Mini-Mite is an entry level version of the Mite telecommunication program. Mite is known to many because it came bundled with Framework I, Kaypro computers, and several brands of modems. Mini-Mite is essentially a stripped-down version of that program, aimed at the hobbyist who will use it for communicating with on-line services like the Source and Compuserve and the local Bulletin Board System (BBS).

Although it is stripped-down, it is not a poor performer. Mini-Mite supports upload, download and capture of text files, binary file transfer with xmodem protocol, and a line oriented editor. It even includes terminal emulation of the ADM-3A. All of this in a freeware package for $15. For ten dollars more, you can get a printed manual, full technical support and upgrade privileges.

The upgrade privilege makes this a unique offering among freeware distributions. For an additional $25 per level, you can upgrade later on to a version with more features. Maxi-Mite adds ymodem, kermit and Mite file transfer protocols, VT100 emulation, and macro strings. Dyna-Mite adds even more features including Morse programming language plus several terminal emulations. So for a little bit of money, you can try it out for a while and if you decide that you need more features later, you can simply order the upgrade you need.

So what you really get is a commercial product at a very low price. In fact, the offer should be tempting even to die-hard PC Talk fans. What you don't get is extensive documentation, or an expensive package. I can do without the packaging, but good documentation is essential to get the most out of a product.

Mini-Mite, like its predecessors is menu driven, but it also lets you enter a local command mode, where the menu disappears and you can enter command strings, proceeded by the proper escape sequence. This lets the user choose the style of interface to suit a given situation. Mini-Mite always comes up in the menu mode, so you have to start from there. All of the functions are supported by menus or local command lines, including the editor.

The text editor is a line oriented editor, similar to EDLINE or the editors supplied with most versions of BASIC. If you are familiar with this kind of editor you may find it easy to use, but it is no word processor. If you want to prepare lengthy files for upload, as I often do, you will be better off with a more powerful editor. But if you just want to edit a short text file to upload, it works fine, is available within the program and is better than most of the editors you will find on a BBS.

The documentation supplied with the freeware distribution is stored on disk. The manual holds itself out to be a short-form document, and that is what it is. It has no table of contents, no index and no page numbers. To get a really usable document, you will have to pay $25 for the whole package. The document, supplied with the disk really needs an index and page numbers to be useful as a reference, after all, many users will probably opt for the cheaper, non-supported contribution and they should not be short changed entirely on

continued on page 224


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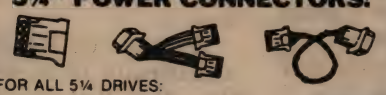

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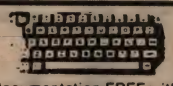

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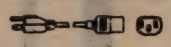

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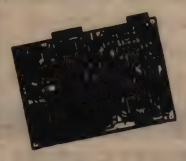

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**PC2COM**
**continued from page 102**

ing the two most common parallel ports found on both machines: the built-in Commodore parallel User Port, and the standard PC-compatible Parallel Printer Adapter card (or equivalent).

**Some Extra Hardware Needed**

In addition to these standard hardware ports, PC2COM requires only two other things to get it running. First is a cable with appropriate connectors for both machines. Second is a slight modification to the PC's parallel adapter board. (These parts will be discussed further in the next section.) If you are handy with a soldering iron, and already have the PC parallel adapter card, you can probably rig up a PC2COM interface for the price of the cable, the connectors, a 74LS74, and some solder. With careful shopping the goal of keeping a PC2COM connection under $50 is easily met.

**The Formal PC2COM Specification**

So much for the general considerations. Now for the specifics. PC2COM is technically defined in the next two sections here. I guess if we wanted to be formal we would call this the PC2COM Technical Specification. There are two parts to the specification. First is the hardware interconnection specification, which you'll need to make a cable with the right connections.

Second is a description of the bus protocol activities, and how the basic signals of the PC2COM bus work. We'll also quickly show you the modifications needed for the PC adapter board. That's pretty much where we'll leave it for now. In future columns we'll start looking at the system software for PC2COM.

**Hardware Specification: Interconnections**

As previously stated, PC2COM is implemented on the C-64/128 side through the Parallel User Port, and on the PC/XT-clone side through an IBM-compatible Parallel Printer Adapter or equivalent. (Figure #1 (page 102) shows the PC2COM lines, and the assigned line names. You should refer to it during this discussion.)

The physical connection between the two ports should be a shielded, twelve wire cable, with ground. For the PC-side, the connector is a DB-25 male connector. For the C-64 side, a 12/24 card edge connector, 0.156 spacing. The proper pin connections for both the DB-25 and the 12/24 edge connector are shown in Figure 1. It also identifies the internal hardware connections of interface bus.

For now, we are specifying a maximum 10 ft. length on the cable (but you can experimentally try a longer one if you desire). The standard 25 wire parallel printer cables often sold with PC/XT-clones will also work. Clip off the Centronics connector, connect the wires you need to the 12/24 edge connector, and leave the rest unconnected.

**Line Definitions**

The PC2COM bus consists of 12 active lines and a common ground. As you can see, the PC2COM lines are identified with short mnemonic names. These lines will be further identified and their functions briefly described, in this section.

First, three are 8-bi-directional data lines named Data 0-7. These lines form the parallel data transfer bus. They are arranged in normal order, most to least significant bit. Electrically, they are simply TTL level, active high, data lines. The direction of flow of data on the lines is controlled by the mode of operation of the bus. At any given time, one side of the bus is operating as a Receiver, and the other as a Sender. The arbitration protocol that establishes the direction of data flow will be further described in the section on the SRT (Send-Receive Turnaround) phase of bus activity.

Although technically not line names, each computer is assigned a Unit number used in the interface specs for clarification. The C-64/128 is always identified as Unit 0, and the PC/XT-clone is identified as Unit 1. (This is introduced here as a preface to understanding the remaining lines.)

In addition to the data lines, there are two data transfer handshaking lines named Hndshk 0 *, and Hndshk 1 *. (An asterisk after, or bar over,

**continued on page 189**


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PC2COM
continued from page 188

the line name, indicates that they are active low levels.) The Hndshk lines are used for byte transfer handshaking. Both Units in the interface have an input and output line for byte handshaking. The output line of each Unit is connected to the corresponding input line of the other Unit. (The Hndshk lines have been chosen and arranged so that they can generate interrupts on the opposite Unit if desired.) The output handshaking line from Unit 0 (the C-64/128) is Hndshk 0. The other line, Hndshk 1 is the output line from Unit 1 (the PC/XT-clone). The exact protocol for the byte handshaking lines is further defined in the section on the BTR (Byte Transfer) phase of bus activity.

The last two active lines of the PC2COM bus are the two control lines, EOI 0 * and EOI 1 *. These lines are used to control the direction of the data bus, and signal End of Information (EOI) during data transfers. Like the Hndshk lines, the EOI lines are outputs on one Unit connected to a corresponding input on the opposite Unit. (The asterisk indicates that they are also active low.) Both these lines are open collector type that are pulled up to +5 volts through resistors in the interface circuitry. Open collector drivers in each interface can then pull the lines low as needed. The complete description of the function of the EOI lines can be found in the SRT and EOI bus activity descriptions.

The common ground is needed to establish proper voltage levels for the interface. Although any of a number of pins on both interfaces could have been used, I arbitrarily chose to connect pin 19 (PC/XT-clone) to pin A (C-64). You might consider connecting several ground pins if you have extra cable lines to spare, just to ensure a better connection. It should not normally be needed, though.

### Bus Protocol: Activities and Signals

Now that we've got our lines defined, let's see how they interact. I've divided bus activity up into three separate phases which summarize most interactions. Each activity has been given a mnemonic label. The main activity on the bus is the simple Byte Transfer (BTR), during which all data is sent from the sender to the receiver. At the end of a data transfer activity, the End of Information (EOI) cycle occurs to signal a transfer operation is completed. Finally, when it's time to switch directions on the data bus, one Unit signals the other to switch modes during the Send—Receive Turnaround (SRT) phase. I've also included simplified bus timing diagrams in Figures 2-4 that should help illustrate what's going on.

Before we look at the descriptions of each phase, let's look at the general rules of the PC2COM bus. First of all, as we already know, there are two Units (number 0 and 1) on the bus. (At this point, PC2COM is only a two node bus, with no room for adding a third unit.) At any given time, one of the two units is acting as a Sender of data, and the other is acting as a Receiver. The Sender is also (by default) the bus master and determines when the opposite Unit can switch modes to become a Sender. When a Sender sends the command for the Receiver to switch over to the Sender, it also switches itself to become the Receiver.

Since each Unit is given equal bus priority, neither Unit is specified as the default Sender or Receiver. The default configuration is left as a software configurable option. So it's a matter to be resolved by the primary applications using PC2COM. If this seems a little confusing now, hopefully the descriptions of the arbitration phases (EOI and SRT) will clear this up.

### Byte Transfer Phase (BTR)

Figure #2 (page 102) is a timing diagram illustrating the Byte Transfer (BTR) phase of the bus. It is assumed, before BTR begins, that bus arbitration has already occurred through default status or a prior SRT phase. (For our discussion purposes, we are assuming that Unit 0, the C-64/128, is the default Sender and Unit 1, the PC/XT-clone, is the default receiver.)

BTR is really a straightforward parallel data transfer operation. First, the Sender sets up the data byte to be transferred on the Data lines

continued on page 190

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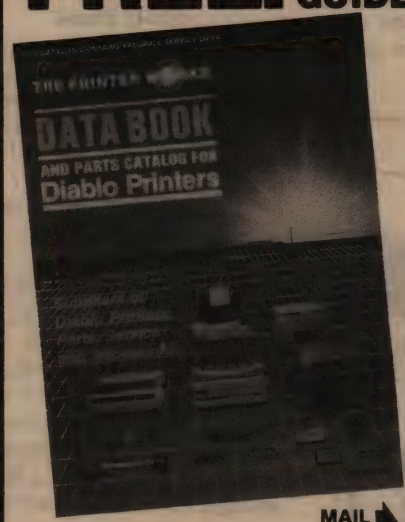


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**PC2COM**
**continued from page 189**

0-7 (event #1 in Figure. 2). After the Data lines are stable, Unit 0 outputs as 1 microsecond (us.) (approx.) low pulse on it's Hndshk 0 line (event #2). That's the Byte Ready strobe signal to Unit 1 telling it to get the byte on the Data lines. After Unit 1 successfully reads the Data lines, it signals a Unit 0 with a Byte Taken it's own Hndshk 1 line low for 1 microsecond (us.) (approx.). It's important that the Sender hold the Data lines stable until the Byte Taken signal is sent from the Receiver.

While the diagram illustrates data transfer from Unit 0 to Unit 1, it also applies to transfers going the other direction. When Unit 1 is the Sender and Unit 0 is the Receiver, the timing is exactly the same, except that Unit 1 asserts Hndshk 1 low as the Byte Ready signal and then Unit 0 responds with a Hndshk 0 low pulse for the Byte Taken signal. This arrangement makes it possible to use just two lines for bi-directional handshaking.

### Time Out! (For Some Comments on Timing)

Here's a short note on some timing considerations: The 1 us. (microsecond) pulse is convenient since we are using the User Port PC * line (that's the 6526 chip line name) on the Commodore, as it's Hndshk output line. The 6526 PC * line automatically provides a 1 us. low pulse on data reads and write to the B parallel port. While 1 us. is hardly enough time for either CPU to do much, these signals can generate interrupts on both machines or can be latched and periodically polled through software (with the adapter board modification to be presented later).

If you notice closely, there's also a break in the lines from the time the Byte Ready signal and the Byte Taken acknowledgment occur. That's meant to illustrate the fact that the Receiver can take it's sweet time getting the byte off the Data lines. Theoretically, the maximum time from Byte Ready to Byte Taken is indefinite. While there is a certain minimum time between the two signals, it's not critical under normal conditions.

Obviously, there are a lot of other timing considerations that aren't fully illustrated here. I intend to develop a more defined timing guide as the project progresses. For now, only the most important events' timing are being considered.

### End of Information (EOI) Phase

After a byte, or series of bytes, have been transferred from the Sender to Receiver during the BTR period, the next bus phase is entered. It's called the EOI phase, for End of Information. (Figure #3 (page 102) illustrates this phase.)

At EOI time, the Sender asserts its EOI line low (timing event #1 in the Figure 3). That signals the Receiver that it should not expect any more bytes in this transmission. It's typically used for things like signalling the end of a file or string of characters that's being transferred.

The Receiver, after sensing EOI, then does whatever it needs to do at the end of the transfer phase, and then acknowledges the Sender's EOI by pulsing its own EOI line for about 1 millisecond or so (timing event #2). The amount of time that occurs from event #1 to event #2 can vary indefinitely. This gives the Receiver as much time as it needs to save a file, print a string, etc.

Finally, if this is a normal EOI, the Sender, after receiving acknowledgment from the Receiver, releases it's own EOI line to go back high BEFORE 90 milliseconds (msec) pass after the acknowledgment (less than Teoih and illustrated by event #3 in Figure 3). Normally, there is no reason why the Sender can't release EOI immediately after the Receiver's acknowledgment. But, if for some reason time is needed, 90 msec is available.

Finally, after both machines understand that BTR is over for now, they go about their own business, waiting for the next BTR phase to begin (event #4 in Figure 3). Neither machines' status as Sender or Receiver is unchanged. (In our example, Unit 0 is still the Sender, and Unit 1 is still the Receiver.)

### Sender—Receiver Turnaround (SRT) Phase

If, for some reason, the Sender holds EOI high for over 100 msec after Receiver EOI acknowledgment, then something tricky happens. Then after the normal EOI period times out (or runs overtime if you prefer) the SRT phase is signalled. In all other respects SRT is almost identical to EOI. (Figure #4 (page 102) diagrams the specifics of SRT.)

SRT is called for when the Sender decides it wants the Receiver to switch over as a Sender and have data sent back to itself. The Sender then relinquishes bus control to the Receiver and switches itself into Receive mode. The original Receiver then switches into the Sender mode and stays that way, until it decides to signal it's own SRT back to the original Sender. This may seem a little complicated now, but further illustration should clarify the matter somewhat.

Let's assume that Unit 0 is the Sender. On a higher software level (still hidden to us) it tells Unit 1 (the Receiver) to transmit a data file over the data bus. After setting the stage for the transfer (on the higher level), it then begins the SRT phase (now refer to Figure 4).

At the end of the Sender to Receiver transmission, Unit 0 initiates what appears to be a normal EOI phase (events #1 and #2 in Figure 4). But, instead of releasing the EOI 0 line within 90 msec., Unit 0 waits at least until 100 msec. have passed (longer than Tsrth in Figure 4). Unit 1 now knows that Unit 0 is signaling SRT, instead of just EOI. So (even before it knows what it will be sending) Unit 1 kicks over into the Send mode (which occurs between events #2 and #3 in Figure 4). Unit 1 (now the Sender) then begins waiting for Unit 0 to finally release EOI 0 high (event #3). When that occurs, Unit 1 knows that Unit 0 has finally switched into the Receiver mode and is ready for the BTR phase from Unit 1.

By the time event #4 in Figure 4 rolls around, both units have switched Sender and Receiver roles. Obviously, just as in the other two timing phases, SRT has a complement. When it comes time for Unit 1 to switch Unit 0 back over to a Sender mode, it goes through the same SRT procedure, only using the EOI 1 line.

### More Time Outs! (Is This a Football Game or What?)

A couple more comments on timing. First of all, the 100 msec. timeout period for EOI

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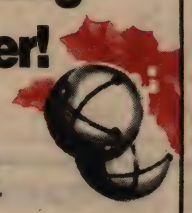

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**PC2COM**
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or SRT was chosen for a simple reason. It is the least amount of time that can be detected (reliably) from both the PC's real-time-clock, and the 6526's TOD clock. Since those are going to be our timing sources, it's wise to stay within their limits. (The 1 msec. EOI/SRT acknowledge pulse is approximate and not really critical.)

Second thing here, in both EOI and SRT phases, the Receiver is allotted all the time it needs to set up for, or clean up after, data that's sent during BTR phases. The EOI/SRT acknowledge pulses are asynchronous, and (like BTR acknowledgment) theoretically indefinite. This relieves the receiver from having to synch up to a transmit clock and do lots of fancy buffering of data. It has time to open a disk file and save incoming files, if need be, between both bytes and BTR phases. But, if the Receiver is really hot to get data, it can also take it as fast as the Sender can shoot it out, since the 1 microsecond (us.) handshaking pulses degrade the data bandwidth as little as possible.

### That's All Folks! (For Now...)

Time to get off this subject for this month. This ought to be enough food for thought for a while. Next time we'll look at the software primitives that drive these different bus phases. Eventually, we'll build on them to make PC2COM do some REAL work for us. Until then, you can start working on the hardware interface. First get the cable ready, and then check out the mods. for the parallel printer adapter (below).

### The Modified Parallel Printer Adapter Card

The standard PC-compatible parallel printer adapter card was designed primarily as a one-way output port (with some handshaking) to drive a Centronics compatible printer. Compared to the complex features found in the C-64's 6526 CIA chip, it's a rather sparce circuit. Basically, it has a couple output latches (an LS374 and LS174), a couple input buffers (an LS244 and LS240), and the additional glue chips needed to hook it to the PC-bus. While the parallel adapter card is more than adequate for a printer output port, it really has more potential than that (which is why it was chosen for PC2COM).

### Latching the ACK Line

If you look at the printer adapter card schematics (found in the various IBM Technical Reference Manuals), you'll notice a funny thing. All the output lines are latched, while all the input lines aren't. This is normally OK for parallel printers, except for one thing. One printer input line, ACK *, really needs to be latched. That's because it's a fast pulsing line used by the printer to signal a byte taken acknowledgment (sound familiar?) It's only pulsed low for 10 to 13 microsecond (us.) and the PC needs to be reading that line when it's pulsed, or it will be lost.

IBM appeared to make allowance for the lack of a latch on this line, by allowing it to generate an IRQ 7 interrupt (software maskable). The only problem, again, is that the CPU has to acknowledge it before the ACK line goes high again, or the interrupt isn't registered properly. Sometimes the CPU is held up with other things and can't acknowledge the ACKnowledgment. (Sorry...)

Anyway, this is also a problem with PC2COM. We are pulsing that line low for only 1 microsecond (us.), and we positively need a latch on it, period. So, to latch the ACK line, we make a simple mod to the printer board. This involves the addition of a single 74LS74 chip.

Fortunately, the 74LS74 is a very common TTL part and is available from numerous mail order sources for about twenty five cents. By piggybacking the LS74 on an existing 14 pin chip on the adapter board, we can just cut a trace, solder about five small jumpers, and we are now latching ACK. (The exact connections to be made can be found in Figure #5 (page 102).) To top it all off, the board is still functional as a normal printer adapter card.

### Turning O into I/O

If you study the adapter card schematic more, you'll also notice that you are able to read in the data lines of the interface by simply reading the Port A latch. This lets you verify the actual output data going to the printer. It also makes you wonder just why IBM added this capability, because it's not a true input port, just a way of checking the actual output data.

Although the parallel adapter is only supposed to be an output port, because of the circuitry present, a simple modification will turn it into an I/O port. This involves cutting a trace to the output latch and reconnecting it to an unused bit in the printer status port. This gives you software control over the parallel port, allowing it to be both a latched output port, or a buffered input port, by setting the status port bit either low or high (respectively). As with the latch modification, this still allows the printer port to appear as an unmodified parallel adapter to software that's not aware of it's new features.

Figure #5 is a modified

**continued on page 192**


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**CP/M 128**
**continued from page 101**

folks who are struggling with the old drives).

Because FOG is having a hard time making ends meet these days, I hate to give publicity to someone who is competing with FOG using FOG's own disks. I know the great many hours that were put into creating and organizing the FOG library. And I hate to think that all that work was done so that someone else could take business from them.

I also know that FOG is not offering their software in 1541 format. So I can't really say that J&B Electronics isn't offering a service by converting the disks from Osborne Executive format to 1541 format. Because of that I will include their address and other information here.

Addresses are at the end of this article.

**Another Perfect Letter**

Dear Ms. Peterson:

I just picked up the September issue of the *Computer Shopper* and after reading the CP/M column and other articles I just knew I had to write to you.

I bought a C-128 last May and started looking for a word processor to replace both Speedscript and the Mirage Professional WP's. The first one I looked at was the upgraded Timeworks program. To put it bluntly, it stunk. Among other defects was the fact that I couldn't get it to operate my SG-10 worth a d*mn. No italics, NLQ, condensed print, not a thing!

In June I bought the Perfect Writer program. I am (was) totally unfamiliar with CP/M prior to buying the C-128 and not that much more knowledgeable when I bought PW and then bought Perfect Filer a month later. I am very satisfied with it (except for a few minor complaints) and haven't used my C-64 word processors for the last month and a half.

Which brings me to the purpose of this letter. I, like you and Mr. Baumgartner (of Mississippi), use a Cardco interface. To be specific, the G-Wiz. Assuming that you and Mr. B own the same type as I do, you and he ought to consult page A1 of the interface manual for an explanation of the dip switch settings. There he will find a setting for a "daisy wheel" printer.

For the Star Micronics printers, all G-Wiz dip switches are normally set to OFF. The "daisy wheel" setting requires dips #2 and #7 to be set ON. This effectively turns off the built-in PETASCII character sets which are in the interface itself. It took me a week of total frustration and heartbreak (I paid $69.95 for the program, and it didn't work?) before I figured it out.

The program (and the CP/M system?) expects to find a standard ASCII printer, like an Epson attached in the same way as a standard printer would be attached (as with an Osborne, Kaypro or even the MSDOS PC's). Mr. B. should have no problems with the printer if he reconfigures the interface. It should also be noted that when you change the dip switches that configuration will not be effective unless you turn the computer off and then on again. Resetting the computer does not reset the printer or the interface.

Regarding being able to use the RAM expansion modules. As I understand it these modules will come with a disk containing an updated CP/M system which will allow it to be used. However, I strongly doubt that Perfect Writer or Filer will be able to use the new system. The reason? Simple!

The Perfect Series comes with the 1 AUG 85 version of CP/M. Included in the package of both Writer and Filer is a note which tells the user to use the CP/M which comes with the package instead of the one that comes with the C-128. The one that came with my C-128 was the 1 DEC 85 version. This has the keyboard echo and the repeatable cursor keys.

I ignored the note and put the newer version of CP/M on my working copy of Perfect Writer. Everything worked exactly as advertised (almost), especially after I solved the printer problem as stated above. Then I tried to print out a multi-page document using the "at-using" commands. These, if you don't know already, are the special print function commands for setting margins, selecting italics or NLQ, etc.

To make a long story short, the Perfect Formatter program (V2.02) won't work worth a d*mn with the 1 DEC 85 version of CP/M. It works perfectly with the 6 AUG 85 version. Because of this I feel certain it (or some other sub-program in the Perfect Series system) will not function properly with any future versions of CP/M unless Perfect Software comes up with a revision of their programs.

Regarding your comments on the dictionary. I hope to breathe Mr. B. is not using his original disks for anything other than to recreate his working copy or as a second backup. I crashed my working disks at least 6 times for Writer and once for Filer (so far) and it isn't any fun!

Also, the manuals for the Writer and Filer both state to use control-C when changing disks in the drive(s) prior to running the programs. Once you are in the Writer, you can only change disks at the PSI menu or when the program prompts you to do so, such as when you select the Filer or Calc option from the PSI menu. Where is it stated that you do not have to use control-C to do this if you have a 1571 vice 1541 drive?

Finally, your question (page 128) as to the advantage of CP/M software over the other C-128 software available. Looking at most of the software available I found that a lot of the C-128 specific software is nothing but a rehash/upgrade of similar C-64 software. I went with CP/M primarily because I have been using a WANG PC in the office for the last two and a half years. It is a MS-DOS machine but is not a "true'defect' IBM clone. Using the WANG word processor and text editor I have become used to not having to worry about saving and resaving files to disk that have the same name. This 'defect' in the C-64 has always annoyed me as I invariably forget to rename the file before attempting the save, it thereby causing a potential loss of data.

Because CP/M works in much the same way as MS-DOS, it was one of the major reasons for buying the C-128 in the first place.

Well that's it for CP/M. Keep up the good work. Thanks.

*Richard Person* of Jacksonville, Florida.

**continued on page 193**

**PC2COM**
**continued from page 191**

schematic of the IBM adapter card, showing the new latch that's been added, and the I/O port modification. I don't have anymore time and/or space to elaborate on the topic this month, so the complete modification description is left until later. If you are technically competent, and have a full schematic of the parallel adapter card, you should be able to use this schematic as a guide to both the modifications, and figure out how it all works. See you later! ●


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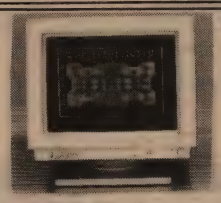

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**CP/M 128**
**continued from page 192**

Thanks for writing with your helpful observations. Since I didn't (and still don't) have the Perfect Series programs, I was at a loss to be able to really help Mr. B.

As to your question about the Control-C when changing disks, I may well have been wrong about the difference between the 1541 and the 1571. As a long time CP/M 2.2 user, almost every time I swap a disk out of a drive I do a Control-C. Whether or not Perfect's Control-C is a carry-over from the CP/M 2.2 days, it never hurts to be on the safe side and do the Control-C. I would do it just to be sure I didn't lose any of my data.

**Last Letter**

I received a letter from someone who doesn't have a C-128 asking me for help. Well, why not?

Cheryl Peterson

Read your C-128 column in the 9-86 issue of *Computer Shopper*. I think you can answer a simple question for us.

I have an Osborne 1, my son has a Commodore 64. When I want to know disk size or space I just use XDIR.

He can't tell me how much his disks store on his 1541 drive. He mumbles something about 664 blocks.

How much disk space does he have? Is there an XDIR for the C-64?

*Jim Riggle, Oregon*

Though I don't know of an XDIR program that gives disk space left in the K reference that you are used to, I can help you. The 1541 stores roughly 170,000 bytes or about 166K or 664 disk blocks. Each block holds 256 bytes. The program to read the directory (the equivalent of our DIR) automatically reads out the number of disk blocks free. To convert the number of disk blocks free to K, just divide by 4. For instance, a clean disk has 664 blocks or 664/4 = 166K.

For those who are running CP/M and downloading programs or data from a C-64 BBS, you can use this formula to figure out whether you have enough space on your CP/M disk to hold a file. Just divide the number of blocks by 4 to get the number of K the file will occupy on your CP/M disks. Of course, this also means that if you're downloading files from an RCP/M using C-64 mode all you have to do is multiply the number of K by 4 to get the number of blocks the files will occupy.

Playnet — Cheryl P
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# ASCII or PETASCII

by Cheryl Peterson

As with the last few months, my mail has been prodigious and helpful. The majority of letters that I have received deal with the PETASCII conversion problem. Those who have Commodore printers don't really have a problem with this, since it gives them just what they need, PETASCII. But for us who use third-party printers, this is a major pain.

So this month, we are going to solve this horrid problem, in a couple quick and dirty ways. The way you choose to do it will depend on your computer proficiency and the system you are using. While these provide a solution, they are not ideal for they require running a program to change the operating system everytime you start working. One of these two solutions has the advantage of being immediately available and easy to use; all you have to do is download or make a copy of the program.

The first solution can be used without resorting to use of a modem or buying a disk from a third-party. Those who bought the newer C128s with the updated operating system won't need this solution, so they can skip down to the next section.

Holger Nilsson of Sweden wrote to tell me about a program that he wrote to solve the problem with his Xetec Supergraphix interface being used with a Toshiba P321 printer. Since this interface uses the same command as the Cardco interfaces for switching into transparent mode, it should work with the Cardco products. I was unable to get the program to work as described however. I will include it and the documentation for those hackers who want to play with it.

### Nilsson's Letters

Dear Ms. Peterson:

For some months I have followed your column on C128 CP/M with great interest. In the Sept. issue you answered a question regarding a problem I experienced earlier this year, so I would like to give my comments on that point.

The question concerns interfacing the Commodore CP/M with an ASCII printer. In your column, Mr. Baumgartner had found that the C128 outputs PETASCII to his printer even though his word processor should output normal ASCII. You replied that there was no way around this problem other than possibly purchasing a more capable interface.

**Author's note:** What I said was that there wasn't much Baumgartner could do about his problem with the Perfect packages and that the one suggestion I had wasn't cheap or ideal. I believe a column a couple month's ago mentioned that the Perfect packages specifically say not to use any other operating system but the one that is sent with the package. Anyway, the rest of us can benefit from what Mr. Nilsson has done.

I faced the same problem interfacing my computer to a Toshiba P321 printer. I use a Xetec Supergrafix interface which is capable of translating PETASCII to ASCII, but this translation is not the ideal solution—the interface intercepts some control codes, so that I can e.g. turn on italics but not turn them off again. Switching to transparent mode gives just a mess as a result.

The explanation for this is the following: CP/M internally uses regular ASCII, so the problem is not with the application program or the general parts of the operating system. Thus, the word processor actually changes regular ASCII codes into PETASCII immediately before sending them out on the serial bus. What you have to do to make it work is to persuade the BIOS not to do the conversion.

I enclose a listing documentation of the program I have written to manage this problem. I have submitted this to SIG/M hoping that it may from there find its way to others in need of it. This letter, written with NewWord under CP/M and typed on my ASCII Toshiba printer, may help to prove my point. This solution is certainly cheaper than buying another interface, which might or might not work.

*Yours sincerely,*
*Holger Nilsson*

continued on page 195

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**ASCII or PETASCII**
**continued from page 194**

The assembly listing and documentation for the program are included here in the column. You will need to assemble the program with either RMAC or MAC. I believe it should work with both the Xetec and the Cardco interfaces. This solution is intended for the hackers who can use the assembler with no help from me.

CONF.COM

For those who aren't into hacking around, there is yet another solution. CONF.COM is a program written by Von Ertwine and placed in the public domain for all of us to use. While it lets you reset the port output from PETASCII to ASCII, it also has options to change the screen parameters. Raymond Carter of Las Cruces, New Mexico wrote a letter about it and his comments on other things are also notable.

Dear Ms. Peterson:

This letter is in response to your C-128 CP/M Column in the September *Computer Shopper*. I think I can help shed some light on a few of the problems mentioned, and also add a few other informative tidbits.

First, I would like to address the problem of using non-Commodore printers with CP/M. The simplest (and cheapest) solution is to get a hold of a utility called CONF. I downloaded it from CompuServe. If you issue the command:

>CONF PRT1 = ASCII5

it will fix up your Cardco interface to work in transparent mode, and receive ASCII instead of PETASCII. If you have a different interface, replace the 5 with whatever secondary address will give you transparent mode with no carriage return. CONF will also allow you to use dual drives with CP/M (may make some MSD users happy.)

Another point I'd like to make is to tell everyone to check all the local computer stores to see if any of them have any CP/M software they'd like to get rid of. I recently purchased WordStar with MailMerge for $29.95 from a ComputerLand store, and also got dBase II for the same price. They were in weird formats (one was DEC VT180 format, and the other was ARCHIVES II format). With the help of a friendly Osborne user who had Media Master, and another friend with an IBM PC clone and Uniform, I was able to convert them both to Kaypro format. They both run fine (I'm using the WordStar to do this letter). The point is, that bargains can be found, and don't be afraid of strange formats—you can probably find someone to help you convert them.

I would also like to put it in another plug for FOG. I really feel that any C-128 user who really wants to use CP/M should definitely join FOG. I also purchased a copy of MicroSoft FORTRAN from a place that advertised in FOG for $28. It came in Osborne single-density format, so over to the Osborne friend once more, and he quickly and easily converted it to Osborne double-density. It too, works just fine. I am quite impressed with it, and can recommend it to anyone interested in FORTRAN for CP/M.

I'd also like to mention that the 1750 RAM expansion is absolutely incredible! When used with disk intensive programs like dBase II or WordStar, you don't ever notice even a pause. I did one brief test and found that Turbo Pascal took 15 seconds to load and execute from floppy and took about 1.5 when run from the RAM disk. Also need to mention that the 1750 comes with a CP/M system disk which includes a new utility program called SCREEN40 which will shut off the 40 column screen from CP/M, and thereby speed things up by about 10%.

The last thing I'd like to talk about is the speed issue. We have read that in CP/M mode the Z80 runs at 4MHz half the time giving a net rate of 2MHz. My tests indicate that it is not quite that bad. In a recent *FOGHORN* article, someone did some benchmarks using Turbo Pascal and other languages. On his Osborne One running at 4MHz he clocked the Sieve benchmark at 29 seconds. I put the same program on the C-128 also using Turbo, and got a time of 53 seconds. I then used the SCREEN40 utility to shut off the 40 column screen, and got a time of 48 seconds. In the meantime I had also seen a suggestion that setting the

**continued on page 196**


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**ASCII or PETASCII**
**continued from page 195**

modem port down to 110 baud might speed things up. I used the DEVICE utility (from the distribution disk) to set the RS232 device and the 6551 device down to 50 baud and then ran the sieve again, and got a time of 41 seconds. So it seems that the Z80 is capable of running at an effective rate somewhat over 3MHz.

I would like to thank you again for the good job you are doing of spreading C-128 CP/M information. I think you are filling a much needed niche in the world! I would like to see you link up with FOG and do a monthly column in *FOGHORN* on the 128 for awhile. I think that you and they could help each other out quite a bit.

*Raymond Carter*

It's nice to see someone else who recommends FOG and *FOGHORN*. I think it's the best $30 a CP/M user can spend. Buying back issues of *FOGHORN* runs a close second.

CONF is still available on CompuServe. It is also available on Q-link or PlayNet, if you want to go to the trouble of downloading it and then converting it from CBM disk format to CP/M format. The programs to do these conversions are available on all three systems.

For those who bought their machines recently, there is no need to get a copy of this program. It is included on your CP/M disks. All you need to do is print up the documentation and use it. Or if you have a Xetec or Cardco interface, just use the command from Raymond's letter. If you have a dealer nearby who is friendly and nice, you might be able to go into his store and make a copy of the utility from his disk.

You should know that this program must be run each time you power up the computer. So while it solves the problem, it must be repeated each time you initialize the system. If you use a SUBMIT file to startup or some other program that autoloads, you must be sure that CONF is run before you load and use programs that access the printer port.

### CompuServe Latest

The CPMIG of CompuServe is giving considerable support to C-128 users. Section three of the bulletin board and data libraries has been set aside for C-128 users. There are about 50 files in DL3 all designed for use on the C-128. Programs from the other sections may also work, but the ones in DL3 are meant to be run on a C-128. I am including a list of the files that are available with a brief description. The listing includes the filename, date it was uploaded, number of downloads and the description. In some cases the description includes the name of the person who uploaded the file.

One thing I'd like you to notice as you go through the list. Some of the files have been downloaded over 100 times. CIS was not the only source for this information, so the downloads only represent some of the many CP/M users who have 128s. It would seem that there are quite a few of us in the world. But then, my mail shows that.

That's it for this month. Next month we'll look at a more permanent solution to the printer problem. Modifying the operating system to eliminate the PETASCII altogether.

### Documentation for PRTASCII

The PRTASCII programs (for the Commodore C-128 with CP/M Plus dated 6 DEC 1985) inhibit the ASCII-to-PETASCII conversion that normally takes place before

**continued on page 198**

```
; This program suppresses ASCII-to PETASCII conversion
; in the output routine for PRT1. In this way an
; ASCII printer can be used as device 4 with a completely
; transparent interface.
;
; Note that this routine only works with CPM+ version
; of 6 DEC 1985. See C128 BIOS (files CXEQU.ASM and CXPRINTE.ASM)
; for details.
;
; The program sets the secondary address for device 4 to 5.
; This suppresses extra line feeds from the Xetec Super Grafix
; interface. Delete this code of another interface is used.
;
; Holger Nilsson 23 Aug 1986
;
;
```

**program continued on page 198**

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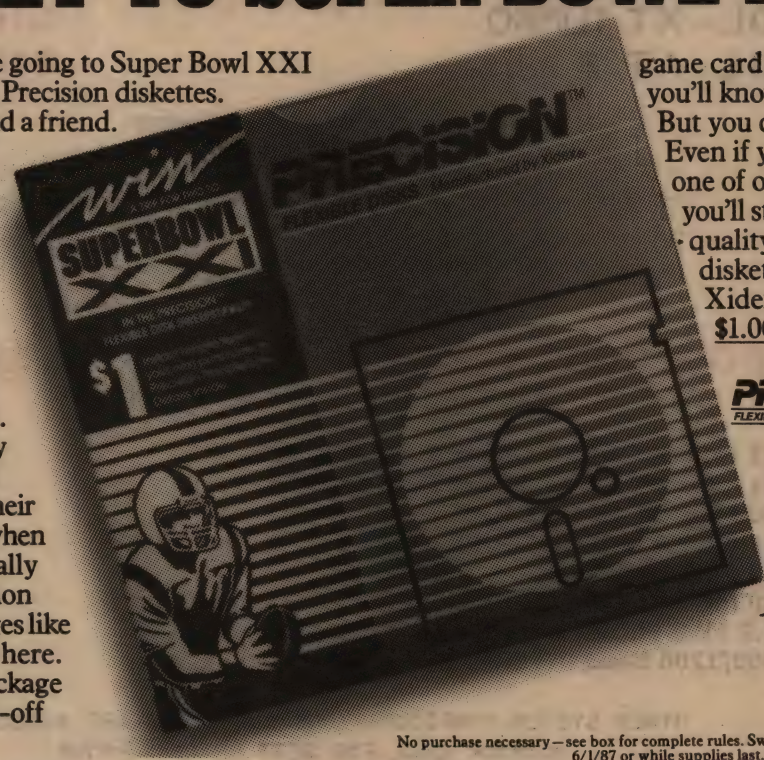


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**Program for ASCII continued from page 196**

```
WBOOT       EQU   0000H
BDOS        EQU   0005H
PRSTRING    EQU   9
USER$FUN    EQU   30
WRITE$BANK0 EQU   1
CR          EQU   0DH
LF          EQU   0AH
EOM         EQU   '$'

SECADR      EQU   5                    ;For Super Grafix

; The following is defined in CXEQU.ASM
;
PRT$CONV$1  EQU   0FD48H

; The following is defined in XCPRINTE.ASM
;
CONVT$NONE  EQU   0D0ABH
CONVT       EQU   0D0AEH

START:      LD    HL,PRT$CONV$1        ; Address of vector
            LD    A,(HL)
            CP    LOW CONVT            ; Check for correct version
            JR    NZ,ERROR             ; ..and unaltered vector
            INC   HL
            LD    A,(HL)
            CP    HIGH CONVT           ; Check high byte also
            JR    NZ,ERROR
            LD    A,HIGH CONVT$NONE    ; Change vector to point to
            LD    (HL),A               ; ..Inhibits extra LF
            DEC   HL
            LD    A,LOW CONVT$NONE
            LD    (HL),A
;
; The following is specific for the Xetec Super Grafix interface
;
```

**ASCII or PETASCII continued from page 196**

characters are transmitted on the Commodore serial bus. This allows the use of an ASCII printer via a transparent interface connected to the serial bus.

The programs contained in the library are:

PR1ASCII.COM for PRT1 (device #4)

PR2ASCII.COM for PRT2 (device #5)

PRASC-SG.COM for PRT1 via Xetec Super Grafix interface

```
            LD    C,SECADR             ; Secondary address 25
            LD    DE,CONVT$NONE+$      ; ..non converting routine
            LD    A,WRITE$BANK$0       ; Call BIOS to write
            CALL  DO$USER              ; new SECADR to bank 0
; End of specific code
;
            LD    DE,OKSTRING
EXIT:       LD    C,PRSTRING
            CALL  BDOS
            RET
;
DO$USER     PUSH  HL
            LD    HL,(WBOOT+1)
            LD    L,USER$FUN$*3
            EX    (SP),HL
            RET
;
ERROR:      LD    DE,ERRSTRING
            JR    EXIT

OKSTRING    DB    'PRT1 set to ASCII"
            DB    CR,LF,EOM

ERRSTRING   DB    'Vector already changed'
            DB    CR,LF
            DB    'Conversion not altered'
            DB    CR,LF,EOM

            END
```

Connecting an ASCII printer to the serial bus of the C-128 gives rise to some problems. Even though the CP/M system (and related programs such as word processors) internally use regular ASCII codes, the BIOS translates these into PETASCII before sending them out on the bus. If these characters are fed directly into a regular ASCII printer, it will not print correctly. Even using an interface capable of translating PETASCII to ASCII is not always the best solution: the interface may intercept some control codes without transmitting them to the printer for which they were intended. The best solution for this problem is to persuade the BIOS to transmit regular ASCII codes to the bus, and to use a fully transparent interface.

The routines that convert the codes and output the characters to the bus are documented in the BIOS listing (file CXPRINTE.ASM) that comes with the optional, CP/M manual for the C-128. The outputting routine jumps to the conversion routine via a vector in common memory (defined in the file CXEQU.ASM). In the printer routines is also present an alternative routine

continued on page 199


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**ASCII or PETASCII**
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that does not do the conversion from ASCII to PETASCII. All that is necessary is to change the appropriate vector so that it points to the alternative routine. The program PR1ASCII does this for printer number 1 (device 4), and PR2ASCII does the same for printer number 2 (device 5); it should therefore be possible to have one PETASCII and one ASCII printer connected simultaneously.

The ASCII printer should be connected via a fully transparent interface. I use a Xetec Super Grafix interface, which in transparent mode adds a linefeed after each carriage return received. This can be switched off by sending the characters to the device using a secondary address of 5 (or 25). The program PRASC-SG is identical to PR1ASCII, apart from setting the secondary address to 5. Note however that the secondary address will always be the same for all ASCII printers. If two printers are connected and the conversion for both PRT1 and PRT2 is inhibited, both printers will be sent the same secondary address (normally 0).

To use these programs, set your printer interface to a fully transparent mode (without sending extra linefeeds). If your printer (or interface) is set to device #4 use PR1ASCII, for device #5 use PR2ASCII. After executing the program the printer should receive ASCII characters. (Users of the Super Grafix interface should set it to transparent mode, device #4 and use PRASC-SG.) I suggest including the necessary program in your PROFILE.SUB file so it will be executed whenever you boot CP/M.

The program will work with the BIOS version dated 6 Dec. 1985, not with the previous release. If the vector does not point to the conversion routine (if you have a different version of the BIOS or if you run the program a second time) it will output an ERROR message and leave the vector unchanged.

The above solutions to the ASCII to PETASCII conversion problems were not permanent; having to be repeated each time the system was booted. There is a permanent solution which requires going into the operating system, making the changes and then writing the resulting NEW system to disk for later use. This can be accomplished using SID or a program called PATCH. These solutions require quite a bit of hacking and some familiarity with the operating system and how it

**continued on page 200**


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**ASCII or PETASCII**
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functions. Also, there are still two versions of the operating system in use, so we need to address the right addresses for each system in use.

One quick aside, all of my letters lately have been addressed to MS. Peterson. I guess this is because most of you don't know my marital state. In case anyone cares, I am married, have a four year old daughter and have another child on the way.

With special thanks to those who sent in letters, back to the subject.

I had three letters from folks suggesting ways to go into the operating system and change the memory locations that control the PETASCII translation. Two letters suggested the use of SID to do this. Fortunately, one gives the locations to change for the old operating system and one gives them for the new operating system. We'll look at these letters first.

Dear Ms. Peterson:

I read in your column in *Computer Shopper* about the problem with interfaces and non-Commodore printers.

I have a Card? B interface and a Toshiba 1340 printer. When printing out letters written in WordStar or printing out listings from SID which contained non-alphanumeric characters, the interface would intercept some of these as special listing codes and print them as a two letter code enclosed in brackets. This made printing out finished copy impossible. After trying all the dip switch combinations on the interface, and having no success, I investigated the printer driver routines.

The source code for the driver is included with the supplemental CP/M material from Commodore and is in the file CXPRINTE.ASM. Because system I/O routines are controlled by the Kernal, the true ASCII from the CP/M side is converted in the printer driver to PETASCII before being sent to the printer via the Kernal routines. All that need be done is to delete the call to the convert routine and CP/M will send true ASCII on to the Kernal.

Without getting involved in details, the way to do this is to load CPM+.SYS under SID, and change the code beginning a 2089 HEX from CD 14 D3 (CALL D314) to 00 00 00 (NOP NOP NOP). Then save this new system file and copy it to your word processor disk. This is for the Aug. 1985 release of the system. I do not have any of the system upgrades so I am not certain that the address of the convert call in memory is the same. Also, this is only intended as an outline of what to do and not a set of instructions for how to make these changes. Some programming skill is assumed because you are fooling around with the operating system itself!

To use the new system just set your interface to pass characters straight through. This is the setup I am using and it seems to work fine. The convert routine itself is not deleted from the system but only the call to it from the printer driver, so if any other part of the system calls that subroutine it is still in place and working.

I hope this information may be of use to you and your readers.

*Robert Emery*

M. Scott Jordan shows us how to make the changes in the new operating system (12/6/85). If you are still using the old system, you can use these instructions, just substitute the memory locations from Robert Emery's letter, 2089.

Dear Ms. Peterson,

I've been meaning to write to you about C128 CP/M but have been sidetracked by all sorts of things over the last couple of months. My chain got pulled when I read your September column in the *Computer Shopper* so I can procrastinate no longer. [**Author's note:** it's a shame that I have to get some folks ticked off before they'll write to me.] It sounds as though the problem which James Baumgartner has with Perfect Writer is that the CP/M system is putting out that "idiot" PETASCII to the printer. Sadly enough, this is exactly what the CP/M printer driver was written to do; it converts the standard ASCII which CP/M uses to PETASCII. In addition, the system always sends a secondary address of 7 whenever it opens a channel to the printer. This secondary address throws many printers for a loop; the MPS-1000 in IBM mode is a good example. If this is Mr. Baumgartner's problem there is a simpler (and less expensive) solution than purchasing an interface. [**Author's other note:** definately less expensive, definately NOT simpler.]

The PETASCII conversion can be eliminated with a two byte patch to the system. Please find enclosed some dumps of the 12/6/85 CP/M+.SYS before and after modification. The modification is crude. All it's doing is allowing the printer routine to enter the conversion algorythm then immediately return processing out of the conversion routine. The changes showing how to prevent transmission of secondary addresses are also included. [**Author's third note;** the secondary address memory location will be different for the original system.]

B> sid cpm+.sys;

Note $272E—it is a $C9. This RETURNs [RET] out the PETASCII -> Standard ASCII conversion in the printer driver. In the original this is an E6.

Original:
2720; 02 FD 79 32 03 FD 3E 07 C3 E8 C7 0E 00 C9 (E6) 00

Change to:
2720: 02 FD 79 32 03 FD 3E 07 C3 E8 C7 0E 00 C9 (C9) 00

Note that the two bytes at $605D have been changed to $A0 and $FF. This prevents a secondary address from being sent to the printer.

Original:
6050: 60 20 05 2A A5 0A 1B 20 C3 FF A5 0A AA (A4 0B) 20

Change to:
6050: 60 20 05 2A A5 0A 1B 20 C3 FF A5 0A AA (A0 FF) 20

These changes allow the MPS-1000 to operate in IBM mode under C128 CP/M. I have no experience with other printers; however, I would think that they would enable the use of any standard printer under CP/M.

These changes can be made
**continued on page 202**


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| LM301/748 | .35 | LM555 | .29 | CA307BAT | 1.50 |
| LM307 | .45 | LM556 | .45 | CA3080 | .85 |
| LM308 | .65 | 558 | 1.10 | CA3089E | 1.75 |
| LM310 | 1.10 | 564 | 1.75 | CA3094 | 1.30 |
| LM311 | .45 | 565 | .90 | CA3130 | .90 |
| LM318 | 1.00 | 566 | 1.25 | CA3140 | .75 |
| LM319 | 1.10 | 567 | .75 | SG3543 | .70 |
| LM324 | .35 | NE592 | .95 | SG3544 | 1.00 |
| LM339 | .50 | 709CH | .80 | CA3822 | .75 |
| LM348 | .65 | 711CH | .60 | LM3900 | .45 |
| LF351 | .45 | 733 | .95 | LM3909 | .80 |
| LF353 | .55 | 741CV | .29 | 4136 | .85 |
| LF355 | .85 | 747 | .50 | SD5000 | 1.75 |
| LF356 | .85 | LM79BCT | .60 | N5534 | .75 |
| LM358 | .45 | DAC0800 | 2.95 | N5596A | 1.50 |
| LM370 | 1.60 | LM1310 | 1.40 | SD6000 | 1.00 |
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| | | | | LM13080 | .95 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 74C00 | .25 | 74C915 | 1.10 | 4027 | .35 | 4072 | .20 |
| 74C02 | .25 | 74C921 | 3.50 | 4028 | .65 | 4076 | .55 |
| 74C04 | .25 | 4001 | .19 | 4029 | .65 | 4077 | .28 |
| 74C08 | .25 | 4002 | .20 | 4030 | .35 | 4081 | .20 |
| 74C10 | .25 | 4006 | .65 | 4034 | 1.40 | 4082 | .20 |
| 74C14 | .55 | 4007 | .20 | 4035 | .65 | 4093 | .45 |
| 74C20 | .25 | 4008 | .85 | 4040 | .65 | 4099 | 1.40 |
| 74C32 | .35 | 4009 | .35 | 4041 | .75 | 4501 | .95 |
| 74C42 | 1.10 | 4010 | .35 | 4042 | .55 | 4503 | .45 |
| 74C74 | .55 | 4011 | .19 | 4043 | .85 | 4506 | .75 |
| 74C76 | .60 | 4012 | .25 | 4044 | .65 | 4510 | .65 |
| 74C83 | 1.20 | 4013 | .35 | 4045 | .85 | 4511 | .65 |
| 74C85 | 1.25 | 4014 | .65 | 4046 | .85 | 4512 | .75 |
| 74C86 | .35 | 4015 | .28 | 4047 | .65 | 4514 | .95 |
| 74C93 | 1.00 | 4016 | .28 | 4049 | .28 | 4515 | 1.60 |
| 74C154 | 3.00 | 4017 | .45 | 4050 | .28 | 4516 | .75 |
| 74C157 | .95 | 4018 | .65 | 4051 | .65 | 4518 | .85 |
| 74C161 | .95 | 4019 | .35 | 4052 | .65 | 4520 | .75 |
| 74C174 | .95 | 4020 | .55 | 4053 | .65 | 4528 | .75 |
| 74C175 | .95 | 4021 | .65 | 4060 | .65 | 4529 | 1.40 |
| 74C245 | 1.75 | 4022 | .65 | 4066 | .28 | 4538 | .95 |
| 74C901 | .35 | 4023 | .25 | 4068 | .35 | 4539 | 1.50 |
| 74C902 | .40 | 4024 | .48 | 4069 | .19 | 4541B | 1.20 |
| 74C903 | .80 | 4025 | .25 | 4070 | .28 | 4553 | 1.75 |
| 74C907 | .75 | 4026 | 1.25 | 4071 | .20 | 4583 | .90 |
| | | | | | | 4585 | .75 |

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| 74S03 | .29 | 74S89 | 2.00 | 74S175 | .75 |
| 74S04 | .29 | 74S112 | .50 | 74S181 | 3.00 |
| 74S05 | .29 | 74S113 | .50 | 74S182 | 2.00 |
| 74S08 | .35 | 74S124 | 2.20 | 74S189 | 1.60 |
| 74S09 | .40 | 74S133 | .45 | 74S194 | 1.30 |
| 74S10 | .29 | 74S135 | .85 | 74S195 | 1.30 |
| 74S11 | .35 | 74S138 | .75 | 74S240 | 1.40 |
| 74S15 | .35 | 74S139 | .75 | 74S241 | 1.40 |
| 74S20 | .29 | 74S140 | .50 | 74S244 | 1.25 |
| 74S30 | .29 | 74S151 | .75 | 74S251 | .75 |
| 74S32 | .35 | 74S153 | .75 | 74S257 | .90 |
| 74S40 | .29 | 74S157 | .75 | 74S260 | .75 |
| 74S42 | .85 | 74S158 | .90 | 74S373 | 1.65 |
| 74S51 | .35 | 74S161 | 1.25 | 74S374 | 1.65 |
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| 74LS02 | .17 | 74LS114 | .33 | 74LS242 | .65 |
| 74LS03 | .17 | 74LS123 | .45 | 74LS243 | .65 |
| 74LS04 | .17 | 74LS125 | .35 | 74LS244 | .65 |
| 74LS05 | .17 | 74LS126 | .35 | 74LS245 | .75 |
| 74LS08 | .17 | 74LS132 | .39 | 74LS246 | 1.40 |
| 74LS09 | .17 | 74LS136 | .35 | 74LS247 | .75 |
| 74LS10 | .17 | 74LS137 | .90 | 74LS243 | .65 |
| 74LS11 | .20 | 74LS138 | .39 | 74LS251 | .45 |
| 74LS12 | .27 | 74LS139 | .39 | 74LS253 | .45 |
| 74LS13 | .25 | 74LS145 | .70 | 74LS257 | .39 |
| 74LS14 | .36 | 74LS147 | 1.00 | 74LS258 | .45 |
| 74LS15 | .25 | 74LS148 | .90 | 74LS259 | 1.20 |
| 74LS20 | .17 | 74LS151 | .39 | 74LS260 | .45 |
| 74LS21 | .22 | 74LS153 | .39 | 74LS266 | .55 |
| 74LS22 | .22 | 74LS154 | 1.50 | 74LS273 | .75 |
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| 74LS32 | .17 | 74LS160 | .29 | 74LS293 | .80 |
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| 74LS75 | .29 | 74LS174 | .39 | 74LS374 | .75 |
| 74LS76 | .29 | 74LS175 | .39 | 74LS377 | .75 |
| 74LS83 | .45 | 74LS181 | 1.40 | 74LS386 | .45 |
| 74LS85 | .45 | 74LS190 | .49 | 74LS390 | 1.10 |
| 74LS86 | .22 | 74LS191 | .49 | 74LS393 | .75 |
| 74LS90 | .39 | 74LS192 | .65 | 74LS398 | 2.50 |
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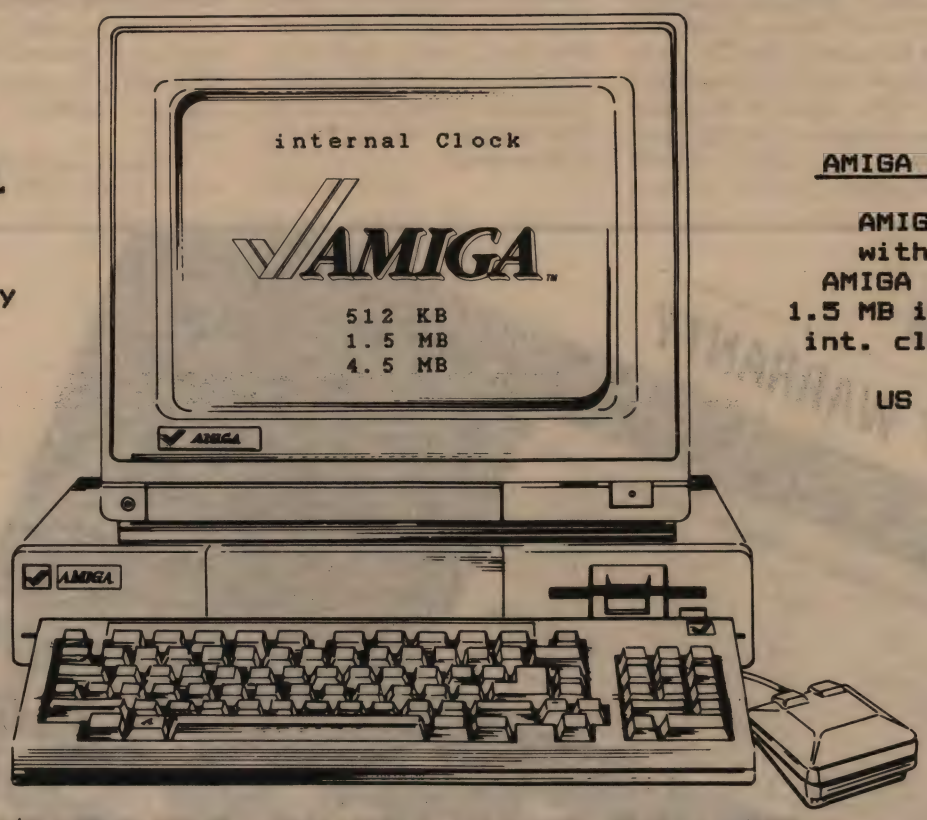


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**ASCII or PETASCII**
**continued from page 200**

with DRI's SID.COM. However, Bill Rink's PATCH.COM is much easier to use. I'm familiar with the older version 1.5. Version 1.8 is available but it contains a minor bug (or an undocumented feature as a Kaypro friend of mine prefers to call it) which makes it slightly more difficult to use than 1.5. Patch is also a good utility for modifying Kaypro routine's screen codes. Patch can search out the Kaypro screen codes in machine language programs and modify them to configure the program for the 128. As an example, the Kaypro version of WordStar runs with the proper screen display on my 128. Also, there is a new C128 CP/M disk formatting program running around. This is a good program but it has a typo which tells me that the program is formatting C128 "Doudle" sided. A quick search by Patch found the typo; it was corrected in a minute. That's a little thing but it took all of about 3 minutes to do and most of that was spent waiting for the disks to load.

*Scott Jordan*

P.S. Forgot to include these two comments:

1) CP/M versions prior to the 12/6/85 release did not support the repeating keys. Whether or not there is a bug in Perfect may not be known but even if there isn't, the other versions will not support repeating keys.

2) Patch might be a good way to check CP/M directories. It has an alpha search built in so you could look for and change bad entries. For example, if you had a bad entry which you knew began with "xy," you could use Patch to search for the alpha sequence "xy" and then correct any bad entries containing this sequence.

Lynn Crawford of Colorado was kind enough to give us the instructions for how to make the necessary changes using SID.

"Will the C128 CP/M+ BDOS Forget a New Printer Interface and Find True Happiness."

Insert CP/M disk in the 1571, hit reset button or type BOOT. When A> appears place the Utilities disk in the drive.

Type SID <CR>.

After the # sign appears on the left margin, place the original system disk with the 6 DEC 1985 operating system file in the drive. Then type R CP/M/M+.SYS (for read in the system file).

The operating system will respond by telling you that the file starts at memory location 100H and requires memory to the location 6400, etc. Now is your chance to change the system.

Type D26F0<CR>

What you see as a screen dump is the printer file with all its corruptive effects on your good ASCII data. If you stop this routine from converting your data to PETASCII it should work for non-Commodore printers. Also the value in position 272EH is the beginning of the routine that is referred to as CONVERT in the source code. Also by a set of tricks, the value of the secondary address is set by incrementing the 06 value from 2700. This forces a secondary address of 07 onto the printer. To make a quick fix of this situation, we can resort to using the A option of SID (assemble).

Press A and then type 272E <CR> Then type RET

This places a RETURN at the beginning of the convert routine (that should turn it off).

Then type <CR> A2722 <CR> MVI A,05 <CR>

Now to save our work. On a new disk that does not have the old CP/M system, we must write the file by typing WCPM+.SYS. If you place a disk with the old CP/M system on it in the drive, the old will be replaced by the new. You should always keep an original of everything that is sent from the factory. Now that you've placed this file on a disk that is 1571 formatted and has a CCP.COM file on it, you can

**continued on page 203**


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**ASCII or PETASCII continued from page 202**

cold boot it to test it. Hit the reset button or press the CONTROL key at the same time as the ENTER (not the return, but the keypad ENTER). The system will boot up the CPM + system file and away you go.

The revisions that I have just described to you work with a transparent interface that works with a secondary address of 05. The assumption is to use an interface on transparent, no linefeed, ASCII printer (Epson or similar.) Of course, now that you know how to alter the printer driver file just get out the meat ax (SID) and have at it.

*Lynn Crawford*

As you can see from this, given time CP/M hackers will find their way around just about any problem. My special thanks to all those who wrote to share their advice and help. It's people like you that make doing a column like this worthwhile.

### The Hidden Manual

As you may know, I read a lot of Commodore magazines each month. Every once in a while I come across something especially interesting. This month's *Transactor* magazine had one such tip. Paul Reeves of Hamilton, Ontario pointed out that there is a 40 page instruction manual included on disk hidden in the CP/M help files. To get to it, you need to use PIP.

If you're using a 1541 drive type PIP LST:HELP.HLP. Make sure you have your printer turned on and online. There will be some garbage at the beginning of the printout, but that will clear up.

If you're using a 1571, you can do away with the garbage. First you must transfer the help file to a new disk. Since it's 83K you do need to use either or a blank disk or one with a lot of space left on it.

```
A> PIP E: = A:HELP.*
A> HELP [EXTRACT]
A> LST:HELP.HLP
```

This 3 step process should give you a nice printout of all the CP/M help files on your master disk.

Transactor is a hacker oriented magazine based in Canada. They generally have some very good articles and I recommend it. It only comes out bimonthly and its schedule has been erratic occasionally, but it's one of the most useful Commodore magazines out there at the moment.

### CP/M Programmers Encyclopedia

QUE books has a book available that is rather unique. *The Programmer's Encyclopedia* by Bruce Brigham outlines the commands used by many of the most popular CP/M languages. Starting with system commands for CP/M 2.x and 3.0, it also highlights CBASIC2, MBASIC, PL/I-80, Pascal, dBase II, FORTRAN and several programming extensions. For these it offers a basic description, commands, limitations, compiler directives, debugging information, editing and/or other things that need to be considered when using any of these. The MBASIC compiler, MACRO-80, LINK-80, LIB-80 and CREF-80 are also covered.

The nine appendixes hold most of the commonly referenced programmer information, including ASCII character set, Z80 hardware information and instruction summary, 8080 mnemonic assembler instruction summary, CP/M Plus BDOS commands summary, and the file control (FCB) and system control blocks (SCB) data.

At $19.95, I think it is one of the best reference works to have handy if you use more than one language or need access to this kind of reference information. Take a look.

See ya next month. Cherp!

Transactor
Transactor Publishing Inc., 500 Steeles Avenue, Milton, Ontario L9T 3P7; (416) 878-8438.

CP/M *Programmer's Encyclopedia*, $19.95.
Que, 7999 Knue Road, Indianapolis IN 46250; (317) 842-7162; (800) 428-5331.

Files for the C-128 available for download from the CP/M SIG of CompuServe.

VDE22C.LBR 20-Sep-86 3

This is VDE 2.20 installed for the C128 personal computer. The overlay was written by Larry Rosenman and is supported by him. This overlay

**continued on page 204**


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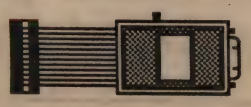

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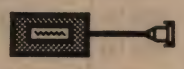

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**ASCII or PETASCII**
**continued from page 203**

WILL NOT work on VDE versions earlier than 2.20. Full documentation is included in this library file.

B5C8-2.INS 10-Aug-86 90
BYE5 insert for the Commodore C128. (This is only good for BYE510 or newer. Read instructions by George Peace on how to install.)

C6DEC.LBR 15-Jul-86 24
This is a RE-UPLOAD of a library file of the BIOS Source for the 6 DEC 85 CP/M system on the Commodore 128 personal computer. It does NOT contain the MAC & RMAC Assemblers necessary to generate a CPM+.SYS file. These can be obtained by sending the card from the system guide in to Commodore (Along with $19.95)

SORTD.LBR 28-Jun-86 139
Sortd.lbr contains the COM and DOC files of a sort and pack program for your C128 CP/M disks. It will sort any disk the 1571 can read/write. Sortd re-writes the directory tracks..any files that have been erased and may have been recoverable will be lost. 66 records. About 1:15 at 1200 baud.

CPM-TR 19-Jun-86 202
For those of you with a C128 that has the old CP/M system (dated 1 AUG 85 or earlier) this may be the program you've been looking for. This program runs in BASIC 7.0 and can be used to install newsys.com and any other CP/M program onto your CP/M disk. For explicit instructions also download and run TRANSL in BASIC 7.0. Hopefully this helps you as much as it helped me. Good Luck!

*Lonnie W*

TRANSL 19-Jun-86 224
These are explicit instructions for using CPM-TR to install and run newsys.com (or any other CP/M program) from a C128 disk directly to your CP/M disk. The CPM-TR program is the one that finally allowed me to install newsys.com and get my new CP/M system in operation. Good Luck!

*Lonnie W*

FORMAT.BIN 07-May-86 315
This is a PRE-RELEASE of a new format program. I have added support for IBM, Kaypro, Epson and Osborne but do not have the means to test on the real computers. If you have one of these computers please test the format and let me know if it works or not. Download as FORMAT.COM, 18 records. PS. I can be reached on CBM2000 76703,2047.

*Von Ertwine*

KERMIT.COM 01-Apr-86 403
This version of KERMIT now supports the RS232 without using the device program. It also supports the SET BAUD command, with 300/600/1200 baud available. Just load and run. 116 records.

C8BIOS.LBR 30-Mar-86 73
Rename to C128BIOS.LBR when downloading as a 8-bit binary library. Contains 22 files including source code for the C128 CP/M v3.0 BIOS, interrupt handler, 40 and 80 column CRT drivers, disk controller, keyboard handler,function key definitions, printer drivers, etc. 1118 records, 140k.

FORMAT.BIN 26-Mar-86 254
Ok, I was fooling around late one night, and I needed a MFM disk. I pulled out the manual on the 1571, and the result is this program to create Osborne 1, Kaypro II and Kaypro IV formatted disks. Please Note, this program only runs in the 128 BASIC 7.0 mode. I uploaded using XMODEM, so do what is appropriate for your terminal. Yes Von, SOMEONE took a long look at your BIOS source. For more info, contact me via Easy-Plex, Acct. # 72426,2312.

C1571.COM 25-Feb-86 686
This is a new version of the disk write speed up program (for 1571). With this version you may use MFM disk and the drive motor will do auto turn-off.

*Von*

FCOPY.COM 23-Feb-86 167
A very simple file copy pgm using the following format: Copya:x.y b:x1,y1. My first attempt at Z80 assembler, written on a C128.

*D.R. Bull*

CATALO.801 22-Feb-86 471
This is the -CATALOG.801 file as found in the SIGMC1.LBR. It contains the names and descriptions of the programs in the library. For those who would like to know the contents before spending the time and money downloading it. /ex

SIGM1.LBR 22-Feb-86 165
Part 1 of SIG/M's CP/M sampler disk for the C128; contains all doc, text and library files. See SIGM2.LBR for all .COM files.

SIGM2.LBR 22-Feb-86 129
Part two of SIG/M's sampler disk for the C128, containing all .COM files. See SIGM1.LBR for all text, doc, and libraries.

BACKGA.COM 13-Feb-86 186
Backgammon for the C-128 CP/M. Don't ask me how to play. (I don't know how)...Any other questions let me know. Download as an 8-bit binary file.

*Matt Flyer*

CPMTER 10-Feb-86 284
This is a hacked together terminal program that loads in 128 mode. You can dl to a CP/M formatted disk in the 1571 drive. Does not work with the 1541 CP/M formatted disk. Public Domain to the best of my knowledge.

CPMTRM.DOC 10-Feb-86 452
This is the doc file for CPMterm found in this dl. This is an ASCII file, so download or just read it. Public Domain to the best of my knowledge. I hope this gets you going with Commodore CP/M!

KAYPRO.RSX 01-Feb-86 223
Download as 8 bit binary file. This RSX can be attached to a Kaypro program that uses video controls (rev, dim, (underline and flash do dim.) Attach by typing GENCOM name Kaypro where name is the program you wish to add the RSX to. Kaypro programs that need this place 0s and 1s on the screen. This is a temp fix as a new system will handle then (in a few weeks).

*Von Ertwine*

CONF.COM 31-Jan-86 622

**continued on page 206**


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**ASCII or PETASCII**
**continued from page 204**

Download as an 8-bit binary file. Can adjust many of the C128 features such as printer type, console baud rate, keyclic volume, cursor type (blinking, solid, underline, etc.), border and background colors and many other parameters. See CONF.HLP for text on how to use and what is available. 26 records (13 blocks), 4k, about ⅔ minutes at 1200 bps.

CONF.HLP 31-Jan-86 707
Download as a 7-bit ASCII text file. Tells what features are available in the CONF.COM file and how to use it, such as setting cursor to blink, selecting border and background colors, etc. Used with CONF.COM. 47 records (24 blocks), 6k, about 1½ minutes at 1200 bps.

NEWSYS.COM 31-Jan-86 854
Download as a 8-bit binary file. This is the official Commodore-approved CP/M+ BIOS for your C128, dated 6 Dec 85. The one you have been using until now was likely dated 4 Dec 85 and had a warning note with it that it was not as yet approved. See C128.DOC as to how to download and install this BIOS on your C128. 212 records, (106 blocks), 27k, under 7 minutes at 1200 bps, about 20 minutes at 300 bps.

DIRR7.COM 23-Jan-86 386
Directory program that alphabetizes vertically, shows size of each file, total files with space used, files remaining and unused space. Type ? to see the menu telling about several unique features likely not available in other directory programs. This version detects and skips CP/M+ time stamp entries. Ready to use, download as an 8-bit binary file. 34 records, under 5k, 1 minute as 1200 bps. Source code included in the 51k DIRR7.LBR file on DL1:

*Irv Hoff*

SARGON.BIN 21-Jan-86 368
This is SARGON V1 for the C-128. I found it on the Kaypro SIG and modified it for the C128.CP/M. I hope that you enjoy it.

*Dan*

12FUNC.COM 20-Jan-86 363
Download as an 8-bit binary file. Easily and quickly changes function key assignments in the IMP modem program. Very short file, 22 records, 3k, about ⅔ minutes at 1200 bps. Also in the IMP244.LBR on DL0: with numerous other peripheral programs.

12FUNC.DOC 20-Jan-86 350
Download as a 7-bit ASCII file. Instruction guide on how to use the 12FUNC.COM program to change the function key assignments to those which might suit you better. (Such as your Compuserve PPN, password, etc.) Very short file, 15 records, 2k under ½ minute at 1200 bps. Also in the IMP244.LBR on DL0: with numerous other peripheral programs.

12LIB.COM 20-Jan-86 374
Download as an 8-bit binary file. Used to change/replace/-delete or alter phone numbers in the IMP modem program. 15 records, 2k, ½ minue at 1200 bps. (Also in the IMP244.LBR on DL0: together with other peripheral programs of interest to IMP modem users.)

12LIB.DOC 20-Jan-86 343
Download as a 7-bit ASCII file. Short instruction guide telling how to use the 12LIB.COM file to change phone numbers in the IMP modem program. Very short file, 16 records, 2k, ½ minute at 1200 bps. Also in the IMP244.LBR on DL0: with numerous other peripheral files.

M7C166.ASM 16-Jan-86 214
Rename to M7-C1660.ASM when down loading. This is the modem overlay for use with the Commodore 1650 and 1660 modems on the C128 running with systems dated after 2 Nov 85.

*Von Ertwine*

M7C166.HEX 16-Jan-86 142
Download as M7-C1660.HEX. Use MLOAD.COM to create MDM730 or MDM740 for use on the Commodore 128. See M7C166.ASM (M7-C1660.ASM). 17 records. This overlay supports the 1650 and 1660 Commodore modems.

*Von Ertwine*

M7C167.ASM 16-Jan-86 182
This is the overlay file for MDM730 or MDM740 using the Commodore 1670 or Hayes compatible modem. This overlay is for the C128 running CP/M systems dated 2 Nov 85 or later.

*Von Ertwine*

M7C167.HEX 16-Jan-86 124
Download as M7-C1670.-HEX. Use MLOAD.COM to create MDM730 or MDM740 for use on the Commodore 128. This overlay supports the commodore 1670 or Hayes look-a-likes. See M7C167.ASM (M7-C1670.ASM). This file is 15 records long.

*Von Ertwine*

MXM128.ASM 16-Jan-86 129
Download this file as MXM-C128.ASM. This is a MEX overlay that works with MXO128.ASM (MXO-C128.ASM) and provides the Modem support for the Commodore modems (1650, 1660 or 1670). Use the SSET command to select modem type or change in overlay then ASM. Other MXM overlays may be used with MXO128 but be careful of addresses. This works on CP/M systems (C128) dated 2 Nov 85 or later. 138 records.

*Von Ertwine*

MXM128.HEX 16-Jan-86 84
Download as MXM-C128.HEX. Use MLOAD.-COM to create MEX that runs on the C128. This is the modem support overlay. You also need MXO128.HEX (MXO-C128.HEX) to support the C128 RS232 device. 20 records.

*Von Ertwine*

MXO128.ASM 16-Jan-86 94
Rename this file MXO-C128.ASM when downloading. This is the MEX overlay file that supports the RS232 device. The modem support is in file MXM128.ASM (MXM-C128.ASM). This file is 113 records long.

*Von Ertwine*

MXO128.HEX 16-Jan-86 74
Download as MXO-C128.HEX. Use MLOAD.COM to create MEX.COM that runs on the Commodore 128. (also see MXM128.HEX) 16 records.

*Von Ertwine*

CPMT03.BIN 13-Jan-86 72
Jimmy B's basic version of the C128 300 baud terminal program on which CPMt12

**continued on page 207**


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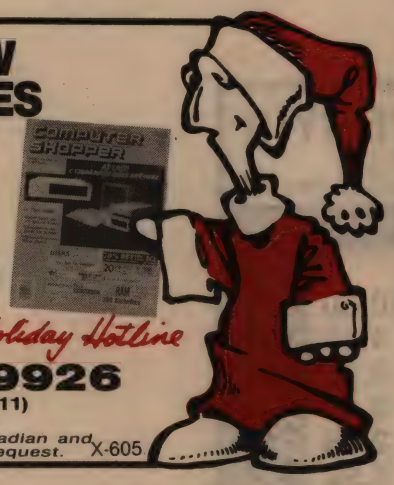

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**ASCII or PETASCII**
**continued from page 206**

was based. Like CPMt12, it works only in C128 mode, only on single sided 168K format CP/M disk. Both have no autodial features.

CPMT12.BIN 12-Jan-86 56
This is a copy of the same program which appears in the TPUG programming SIG. This program runs in C128 mode only. It runs at 1200 baud only and does not have autodial routines (unless you have HAYES compat, then you can dial from the terminal screen). It was put together using a basic version of the same program which works at 300 baud only by Jim Broughton. Skyles Blitz for the C128 was used to speed it up, along with some corrective work on the XMODEM syte.

IMP.DOC 12-Jan-86 572
IMP instruction guide. Download as a 7-bit ASCII file. 289 records, 38k, about 8 minutes at 1200 bps. Dated 01 Oct 85, mentions IMP241 (IMP244 is current but no changes involving operating procedures have been made—mostly things like adding capability for Anchor Modems, different header display for batch mode, etc. have been made since then.)

BIBOOT.IMG 31-Dec-85 776
This is a 128 basic program that will allow the use of only one drive and one disk to transfer NEWSYS.COM off of your CBM disk onto a CP/M disk.
Much easier than method described in IRV.DOC especially if you only have one drive. The program is self explanatory. I hope this helps some of you out. NOTE: download NEWSYS.COM as a PROGRAM file as the boot must read it as a prg file.
-=*> JOE <*=-

64CONV 27-Dec-85 990
Download as an 8-bit binary file. Commodore C128 program used to convert sequential files that are in "64 disk format" over to "CP/M 128 disk format." (See C128.DOC.) 87 records, 11k 2-½ minutes at 1200 bps.

C128.DOC 27-Dec-85 1110
Download as a 7-bit ASCII text file. The Commodore C128 does not support modem use in their CP/M mode. This file explains how to get and install the new BIOS as well as the IMP-C128.COM modem program (on here as IMP-C8.BIN) which is ready to run on the Commodore C128. A vast number of these computers have already been sold and many owners have been waiting/looking for this information. 96 records, 12k, 2-⅔ minutes at 1200 bps.

C128.IRV 27-Dec-85 1443
Download as a 7-bit ASCII text file. "Attention file" for Commodore C128 users—tells what files they need to obtain so they can use a modem in the CP/M mode. This is the information thousands of Commodore C128 owners have anxiously been looking for so they could participate in getting CP/M programs over the telephone. The IMP modem program is ready for their use and is called IMP-C8.BIN on this SIG, (ready to run on a Commodore C128.) 21 records, ⅔ minutes at 1200 bps.

12C8-1.ASM 27-Dec-85 492
Download as a 7-bit ASCII text file. IMP overlay for the Commodore C128 computer. Requires the new Commodore BIOS to be installed as the original CP/M version did not support an external modem. See C128.IRV and C128.DOC for additional information. 118 records, 15k, 3-⅓ minutes at 1200 bps.

IMP-C8.BIN 27-Dec-85 1214
After downloading as an 8-bit binary object code file, rename to IMP-C128.COM. This is the IMP modem program ready to run on the Commodore C128. (see the C128.DOC file for comments on how to install on the C128.) 144 records, 18k, 4 minutes to download at 1200 bps.

MEX128.BIN 27-Dec-85 278
Rename to MEX.COM when downloading as an 8-bit binary file. This program is the standard MEX.COM preinstalled for the Commodore 128. The user should also download MEXHLP.BIN. This program has support for the Commodore 1670, 1660 1650 and 1011A (RS232 adaptor) by using the SSET command (default is 1670 at 1200 baud). This file is 24k or 192 records long and will take about 6 mins. to download at 1200 baud.

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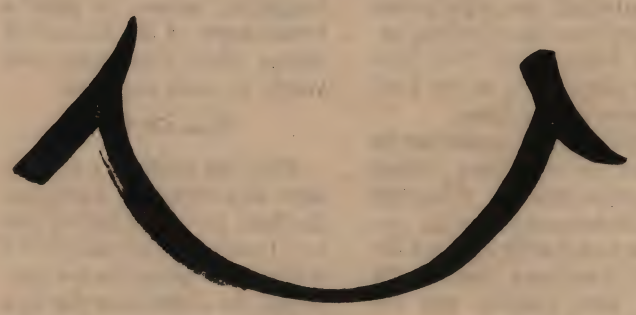

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# Activision Entertains and More

by Cheryl Peterson

Activision, Inc. has announced many products in time for the Christmas season this year. Ranging from productivity software to games, they've got something for everyone. Their acquisition of InfoCom and Gamestar made an already large selection of great games even larger. And now they've added distribution for Electric Dreams another gamesmaker. In addition, their two new divisions for productivity and creativity software are taking Activision away from being exclusively a games company.

However, for this article we'll focus on the fun stuff. I'll include a shopping list at the end of the article so you can see whether the products I mention are available for your computer. Activision is doing software for almost every home computer made.

Lets start with the simulations from Gamestar; Championship Baseball, Basketball and Golf. Of these, I have the C64 version of the baseball game on hand. For any of you who wonder about my qualifications to judge a baseball simulation program, I've been a major leagues follower (St. Louis Cardinals, in particular) for almost 20 years. As a player, I was limited to softball because "girls don't play baseball!," but the strategies are similar.

Championship Baseball allows you to be both coach and players. In fact, you can be the whole league. Your teams are saved on a separate disk so there's little danger of damaging your program disk.

You start out by choosing team members and batting line-up. The information you are given on the players is not what you would look for in choosing players in the real world. No batting averages, fielding percentages, errors, bases stolen, or earned runs averages. Since these things don't determine how well your players play, I guess they wouldn't do you much good if you did have them.

Coaching decisions revolve around when to send in a pinch hitter, which pitches to throw, instructions to base runners and whether to try to steal. Pitching decisions seem to be based on a hint as to what kind of hitter you are facing; slugger, liner, etc. You have eight pitching options some of which are guaranteed to miss most of the time. The pitcher's accuracy is supposed to be based on number of pitches thrown and a few other tangibles. Being a pitcher myself, I found the joystick controls to be very disconcerting. My pitches just never seemed to catch that outside corner like they do in real life.

While we're on the subject of playing the field...When the other team gets a hit, the fielder closest to the ball (as determined by the computer) becomes active. You then use the joystick to control that players movements. I found the reaction time necessary to cover the play much too quick. In real life, outfielders have a few seconds to get into position. And the closest player isn't always the one who gets there.

I found that the program totally ignores the first rules of backup play. The third baseman doesn't backup the pitcher on a bunt. The pitcher doesn't backup the first baseman who should fade back on a line drive to right. The second baseman doesn't cover the hole to the right side when there's a player on first, etc. And forget a ball being fouled off in fair territory. (Yes, I am picky!)

And then there's batting. The batter takes a swing straight down the middle of the plate, period! No high swings, no low swings, no hitting to the opposite field. The only option the batter has is whether or not to bunt. Well...you do have the option of not swinging at all. Thank goodness for the batting practice option. You can learn to hit, but it takes more coordination than hitting a real baseball.

Not to be totally critical, I did like the quality of the graphics. The split screen allowing you to see the field and view from the catcher's position at one time is really nice. For amateur baseball fans, this might be a nice simulation. For hard core fanatics, I don't think so.

### Transformers, Battle to Save Earth

I found this arcade/strategy game to be a blast. (OK, so I'm probably a little old for that sort of thing. Too Bad!) The introduction is really nice; a mini-history of the Autobots and Decepticons. Of course, the Decepticons are out to steal all of Earth's energy and you have to stop them by intercepting them with the eight Autobots under your control. You deploy them to strategic locations and then fight the Decepticons whenever they raise their ugly heads. The

continued on page 209

# Sylvia Porter's Personal Finance Program

by Cheryl Peterson

Ever wonder where all that money you earn goes? Thought about the wonderful things you could do if you only had a little more left at the end of the month? And what about that new car you've been wanting for so long? Could you really afford it if you didn't spend so much money on luxury items?

With Sylvia Porter's Personal Finance, you can find out.

About four years ago, I tried tracking all my spending for a whole year. I got a ledger and wrote down every penny we spent and every penny we earned. Fortunately, I was just starting my writing business and had plenty of time to waste writing down figures and using my calculator. I spent hours each month. I sure wish I'd had this program back them.

Mind you, this program will not do away with the need to keep track of figures. Instead of writing them down, they are entered into the computer and saved on disk. Sylvia Porter's Personal Finance (SPPF) will keep track of as many as five bank accounts and ten credit cards. With the transaction manager module you track cash, check and credit card purchases, as well as income.

Setting up the data disks for SPPF rather resembles setting up the Chart of Accounts for a small business. In fact, the entire package parallels the bookkeeping process used to run a business, right down to tracking "petty cash" expenditures.

You set up checking, credit card, and cash income and expenditure accounts. The default categories provided will be adequate to meet most families' needs.

As with a double entry ledger system, if you enter a transaction to pay a credit card charge with a check, you must show the debt being paid off and subtract the appropriate amount from the checking account being used. The program allows you to do both processes at one time.

Automatic payments can be entered so that they repeat themselves monthly. When the bank statement comes in, you can sit down with it, mark the items that have cleared the bank and quickly get the justified balance.

Of course, just knowing where the money is going is not enough. By using the budget manager you can try to bring your expenditures under control. The categories used in the budget should help you see where you can trim the fat. And a monthly comparison can be made to see if you're managing to stay within the budget you create.

An assets and liabilities manager lets you keep track of major investments like real estate, cars, life or other insurance policies, and income bearing accounts, certificates or bonds. The categories in this section help track some vital IRS information.

The final section allows for planning. With this area, you set up a worksheet of financial goals such as money for children's education, major purchases (like cars or real estate), investment capital for a home business, home improvements, and/or establishing a retirement fund.

You set dollar values needed for each goal and a completion date for having raised the needed capital. The program uses information from your budget, assets and liabilities and actual expenditures to determine whether goals can be met using the current budgeting system. It gives a break-down of the amount of money which must be set aside yearly to meet each goal.

### Ease Of Use

First, the program is terribly slow and there are numerous modules to be loaded in and out. I can't imagine using SPPF without a quick-loader cartridge. In addition to the four C-64 disks used, there are three data disks. To use the planning module of the program requires switching in all the data disks at one time or another.

I wish I could say that the C-128 version has great improvements over this, but though the program disks are reduced to two, three data disks are still necessary. The 128 version does support the 80 column screen, which allows you to see what you're doing a bit more clearly.

Not to be totally negative, the pull-down menus are quite handy to use. The on-disk accessories (calculator, note pad, etc.) are also very handy. The notepad items are keyed to the appropriate module of the program and are saved on whatever data disk is used by the module you are in. The results of calculations done with the calculator are easily swapped into your work area.

The documentation is very good. Besides explaining how the program runs, it attempts to teach you some of the principles of basic finance. The illustrations, where needed, are adequate. The tutorial nature of the program is well supported by the docs.

The program highly recommends (several times) making backups of your data disks. Each C-64 disk can hold up to 1250 transactions. The 128 disks should hold about twice that amount.

Although the program is copy-protected, Timeworks provides back-ups for a slight extra fee. Disks with problems can be returned for replacement. If the warranty has expired, a few dollars must accompany the original disk back to Timeworks.

### Printed Forms

The transaction manager has an option to print checks using the popular NEBS computer forms pre-printed checks.

A variety of report formats are available to show you where your money is going and how you should be spending it in order to meet your financial goals. A screen print option is available whenever you'd like a hard copy of what is on the monitor.

### Conclusion

Sylvia Porter's Personal Finance could be a great help to those who find money management an impossible hassle. It can give you a realistic picture of what is possible under your current income and spending limitations.

Sylvia Porter's Personal Finance
C-64 $49.95
C-128 $69.95

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**Activision continued from page 208**

baddies are acting on a plan so if you can figure out the plan you have some chance of stopping them. It isn't as easy as it sounds. Even adults can have fun figuring this one out.

The graphics and arcade action are nice. I found the segments where the Autobots transform from robots into cars/trucks cute the first time through, annoying there after. Since they do the transformation thing everytime you deploy them, it kinda grates after awhile.

A little added realism, ammunition is not unlimited, so the Autobots must return to base for supplies if you waste too many shots. If they are damaged you must divert them back to the base for repairs. All in all, I liked this one.

### Hacker II, The Doomsday Papers

This one is tough. Where the original Hacker was fun, but a little easy for some to figure out, Hacker II is intricate and a definite must for gadget freaks. This time you use a more complicated version of the SRU. You must explore a top-secret base in Siberia and steal some plans that the Russians have hidden away in a vault. To get the combination you must check out four filing cabinets. There are spy cameras in every room and a security guard walking the corridors. A malevalent intruder destroyer stalks the complex when an unauthorized presence is detected.

Hacker II will keep you busy for hours even if you don't solve it. A successful conclusion could take weeks to reach.

### Shanghai, Mah Jongg Meets the Micro

I must admit to a little prejudice on this one. Two years in the Philippines introduced me to this game and I loved it even then. Played with 144 tiles, there are versions for two players, teams, or individuals. A unique idea is the tournament play.

The solitaire version works similarly to the card game, the end coming when all the tiles have been used. Unlike solitaire in cards, Shanghai starts with all the tiles in a three dimensional pyramid. Only tiles on the outer edges can be removed and to be removed they must be matched with another tile. You remove two at a time, continuing until there are no more tiles or no more matches to be made. Don't expect to win easily. If you are playing a randomly created game, there is no guarantee that you can win.

The disk does contain some games that are winnable. But it takes patience, strategy and more than a bit of luck to win.

The two player version works similarly to a timed chess match. Each player has a given amount of time to find a valid move. The amount of time is determined at the beginning of the game and several options are offered.

Tournament play allows a number of players to try the same pyramid. The computer tracks how many tiles are successfully removed and the amount of time taken to play. There can only be one tournament active at a time.

I have three versions of this one here; C64, Amiga and Macintosh. Each has a different ending if you should successfully conquer the pyramid. Though I have won them I won't spoil your fun by telling you how they turn out. One hint, the pyramid is called the "dragon."

Of course, the C64 graphics look very primitive when compared with the other two. But the game plays well and seems to go just as quickly as the Mac and Amiga versions. It would be hard to tell which of the 68000 machines is really faster.

Comparing the Mac and Amiga versions is a little more fair. Until I saw this program, I never really realized what the Amiga's "Great Graphics" meant. The Mac may have greater resolution, but the colors and shading on the Amiga were just outstanding. The Mac achieves a small degree of three dimensionality, but the Amiga really maximizes it. The shadowing behind the tiles is so real it's scary. When you choose a tile on the Mac, it changes to reverse video. When you choose a tile on the Amiga it gently lights up like a backlit translucent switch.

Of course, this doesn't effect the playability of the game. The pull-down menus are similar in all three versions. If you need help the program will show you all the available moves one at a time by highlighting the appropriate tiles. You can back up one move at a time all the way to the beginning of the game if you wish. You can restart a game at any time. Games can be saved and resumed later if you wish.

I hesitate to admit the amount of time I've spent playing this game, but at least I can hide behind the claim that it was "research for an article." Of course, now that I've written this what excuse do I have? (DRAT!)

### Tass Times in Tonetown

OK, so it has a funny name. I still enjoyed it. Activision was nice enough to include a cheat sheet with this one, so I wouldn't get stuck in the real world. I suppose a few reviewers might have needed the help. In my case, it just got me into the story a little quicker.

Tass is an illustrated text adventure game that is designed to minimize the amount of typing you have to do. A window shows the present conditions in the story, complete with little depictions of key items. An icon menu has pictures representing take/get, drop, talk, look, tell me about, hit/fight, enter and buy. Above these is a compass.

Rather than typing in the words, you need only point the cursor arrow at the icon and press the fire button (click). You can also point to items in the scenery window and click on them. For instance to look at the tree, you would point at the Look icon and click, then point to the tree and click. You can then hit return or click on the return icon to enter the command.

There are a few commands that require typing. Most of these are directly related to the

**continued on page 210**


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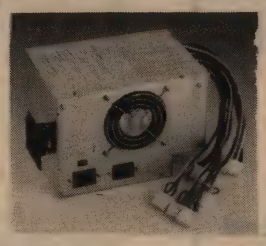

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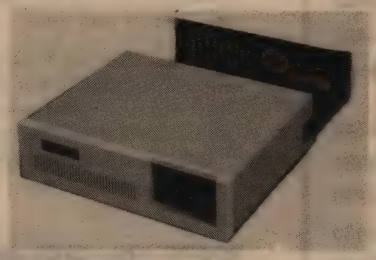

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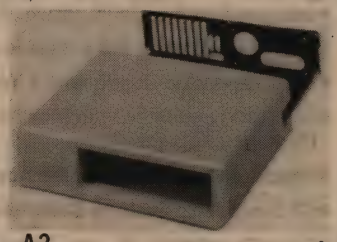

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**Activision continued from page 209**

more complicated puzzles of the game and having an icon would give it away.

Another window shows the items you have collected. To drop an item you need only click on it. If you click on an item in the scenery, the program will figure out whether you want to look at it or pick it up. Many items can be seen not taken.

A menu bar at the top of the screen contains a ? (which opens a window telling who wrote the program,) and load and save options. You may save as many as ten games numbered 0-9. A pointer shows the last game accessed. You cannot name the games for future reference, though.

The plot requires you to go to Tonetown and save your Grandpa from the baddy who has him locked in a tower. Then you have to save the town from the same baddy. There are a number of unpleasant ways to die and they all involve big teeth.

One of the first things you have to do is become Tass so you'll fit in. The townspeople have a very low tolerance for tourists. (One hint—this requires money so look for something that you can use for currency before you leave the lab.)

I'm not sure whether I like the game better because of the plot or because the input is so well designed. It could be a combination of both. Anyway, I spent quite awhile with this one and loved it.

### The Ones I Haven't Tried, Yet

Labyrinth, designed by Lucasfilms, is a computerized version of the movie that featured David Bowie as the gremlin king. It is supposed to have all the wonderful Jim Henson characters that were in the movie. Of course, the object is to explore the maze and find your way to the gremlin king, who has promised to free you if you find him within 13 hours. If it is anything like the other games that Lucasfilms has done, the graphics are bound to be wonderful.

Another film-based game is Rocky Horror Show. If you're like me and have managed to avoid the film, now's the chance to get some idea of what the movie's like without actually going out to see it. (OK, so you have a VCR for that sort of thing. I like my movies interactive.) From the brief (and I do mean brief) description, it sounds like it could be great fun. Imported from Europe, it was a best seller there.

Another European best seller, Zoids, is an arcade and strategy game in which your nice Zoid must destroy the baddy Zoids. From the info I have on it, it sounds like Zoids resemble our Transformers or other robot toys.

The third European import is Spindizzy. As far as I can tell the games objective is to explore as much of the landscape as possible before running out of energy. Certain actions obtain bonuses and may give you more time to explore. Could be fun. From a company called Electric Dreams.

The other new packages are creativity software; Garry Kitchen's Gamemaker Designer's Libraries and Paper Models: The Christmas Kit. The Christmas Kit designs and prints paper models that can be used as decorations or given gifts. You can create three ornaments, boxes, gift holders, a holiday train or a Dickensian village. The kit includes a glue stick, a ruler, red and green marker pens, jingle bells and 10 sheets of card stick (thin cardboard.)

There are many cute designs that you can put on your creations, ranging from snowflakes and holly wreaths to Santa Claus heads and reindeer. It looks like this could be a great way to get your children into the personal touch at Christmas and away from the commercialization that sometimes goes with it. (What can I say, we still decorate our tree with hand-strung popcorn.)

The Designer Libraries work with Garry Kitchen's Gamemaker program. These libraries make it easier to create sports and science fiction games. Each includes backgrounds, sprites, sounds and music for use with your games. These can be modified using the modules of the original Gamemaker program. The Sports disk includes archery, baseball, tennis, football, skiing, golf, racing and skeet shooting (to name some of them). The science fiction disk has monsters, jets, ray guns, space ships, planets and their surfaces, and other futuristic items.

### Conclusion

As you can see, Activision intends to make sure there's something for everyone in their lineup this Christmas. As it's only October as I write this, look for more products before the end of the year.

Since this list was compiled in October, it is not definitive and versions of these may be available on other computers. Check with your local dealer or mail order firm. ●

Key, ST = Atari ST
All = Apple II
MSDOS = selected MSDOS machines

| Title | Systems |
|---|---|
| Championship Baseball | Amiga, ST, C64 |
| Championship Basketball | Amiga, ST, MSDOS |
| Championship Golf | Amiga |
| Tass Times in Tonetown | Amiga, All, ST, C64, Mac, MSDOS |
| Hacker II | Amiga, ST, C64, Mac |
| Shanghai | Amiga, ST, C64, IBM, Mac |
| Transformers | C64 |
| Labyrinth | All, C64 |
| Rocky Horror Show | All, C64 |
| Spindizzy | All, C64 |
| Zoids | All, C64 |
| Gamemaker Modules | All, C64 |
| Greeting Card Maker | All, C64 |
| Paper Models, Christmas Kit | All, C64, IBM, Mac |
| Not new, but worth looking for: | |
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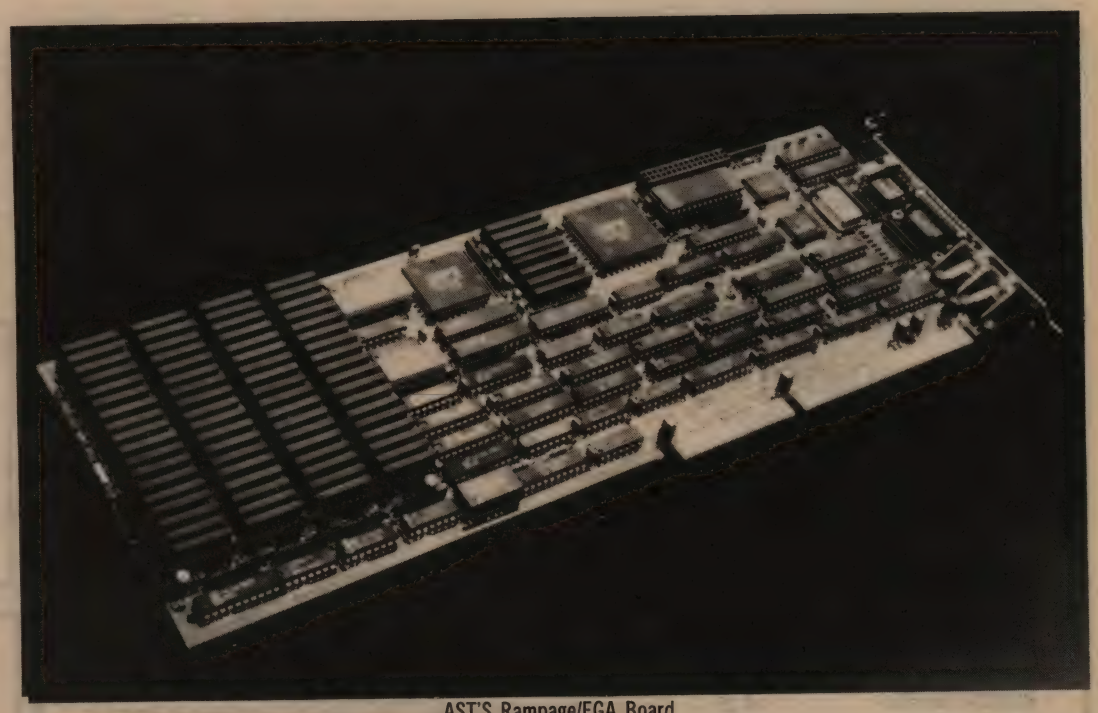
# AST Research Introduces New Rampage/EGA Board

In response to the growing requirement for higher personal computer performance, AST Research Inc. has introduced a new add-on board that provides both high-resolution EGA (IBM enhanced graphics adapter) graphics capability and expanded memory on a single-slot board. This new product offers the user increased AT performance and saves limited PC/AT expansion slots for additional enhancements. Formerly it took two full-size cards to provide the same capabilities.

The new board—dubbed RAMpage/EGA for the AT—supports up to 2 megabytes of memory that is compatible with both the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS) and AST's Enhanced Expanded Memory Specification (EEMS), which is a superset of the EMS standard. As a result, users of application programs such as Lotus 1-2-3 Release 2.0 and 2.1, Framework II SuperCalc 4 and Symphony 1.1 can access memory beyond 640 kilobytes (Kbytes) for data and applications, eliminating "memory full" messages.

With the boards's split memory addressing feature, the RAMpage/EGA product enables additional memory to be used in a variety of ways. For example, on a PC/AT with 512 Kbytes standard, split memory addressing would fill conventional memory to 640 Kbytes and then allocate remaining memory to expanded or extended memory. Extended memory could be used to create large RAM disks or print buffers and to run current and future protected—mode operating systems like XENIX.

AST's RAMpage/EGA for the AT board also supports four different graphics modes —including IBM Enhanced Graphics Adapter (EGA), IBM Color Graphics Adapter (CGA), IBM Monochrome Display and Printer Adapter (MDA) and Hercules graphics—providing compatibility with all the PC graphics standards. A user-selectable switch enables easy movement between desired graphics modes.



AST'S Rampage/EGA Board

Additionally, the RAMpage/EGA board works with the IBM 5154 Enhanced Color Display, IBM 5153 Color Display, IBM 5151 Monochrome Display and compatible monitors, providing immediate compatiblity and future upgradeability to the EGA standard.

Included with RAMpage/EGA is AST's SuperPak utility software—SuperDrive, fASTdisk and SuperSpool. These programs enable users to create electronic RAM drives while entering and processing data.

For more information contact AST Research, 2121 Alton Ave., Irvine, CA 92714; (714) 863-1333.

Mention that you read about it in *Computer Shopper*. ●

# Beautiful Dreamer

Dreamer Keyboard

by Dr. Michael W. Ecker

Well, maybe the product is not as melodic as the song, but those who are involved with data entry, particularly the most intensive users of the most popular spreadsheets and word processors, will be interested in this timesaver.

The Dreamer is an intelligent function auxiliary keyboard with preprogrammed instructions to do the most tedious and repeated chores for you. Do you get tired of having to use a half dozen or so keystrokes just to format a 123 spreadsheet? Would you like to be able to do the same in one keystroke? Perhaps trying to learn Word Perfect commands has gotten you aggravated. Even such easy tasks as saving and loading files, for instance, can require knowing and then executing quite a few keystrokes each time, and it would be nice to have a means of touching one key and having the same result.

Now, before you jump on me, please note that yes, there are key macro programs which allow you to program key combinations to do these for you. Such software programs include SuperKey, KeyWorks, Prokey, and yes, there are the others (and I don't mean to slight competitors by not mentioning their names). But while these programs have the advantage of flexibility, they have the disadvantage of requiring you to program the macros—more about this later. Such programming is not necessarily difficult, and some programs may include some files to get you started to do this, but basically you do the work. In practice, these programs usually involve two keys and sometimes three to work, whereas the Dreamer requires only one.

T.S. MicroTech evidently wished to address itself to the market of users looking for a hardware tool to save them some drudgery. Such users, it evidently reasoned, did not wish to fool around with programming the combinations (which many users consider just as much drudgery). These users would want something ready to plug in and go.

The Dreamer unit is a lightweight keypad—about two pounds—measuring 9" long by 6" wide by 2" high. The unit is angled to emulate a keyboard for ergonomic comfort, so the shape is not exactly a rectangular solid. I counted exactly fifty keys on this little keyboard, each a precise square, with each square labeled with either a number or a function, including independent cursor keys. You plug in your regular keyboard's coiled cable into the Dreamer, and the outgoing cable from the Dreamer you then plug into the regular port for the keyboard cable. Hence, this product is literally intermediate between the keyboard and the computer. It does not require any pre-load software or additional cards or memory to operate, as the Dreamer sends signals which are treated as though multiple keystrokes were coming directly from the ordinary keyboard. In practice using 123 and Dreamer, I observed the command menus rapidly changing before my eyes as I touched a single key. The speed, in fact, was so good that it was impossible to follow what was going on in most cases.

The programs supported are 123 and Symphony for the spreadsheet family, with a wider variety among word processors: WordStar, WordStar 2000 Plus, Word Perfect, Multimate Advantage, and Display Write III. If you don't use any of these, it would appear that there is no way to use the Dreamer.

One caveat to users of compatibles, especially Tandy 1000s: The Dreamer was created for PCs and XTs and only clones which are plug-compatible. If you look at the plug on the end of your keyboard cable, it might have either five or nine pins. The 1000 has nine, and the IBMs, as well as the Tandy 1200s, have five. The Dreamer requires a five-pin port. Because of this, unless there is a way to create an interface, you'll have to have the proper compatible.

Since I could not use my Tandy 1000, I tested the auxiliary keyboard on the Tandy

continued on page 214

# Low-Cost Verbal Interface System

A voice recognition system for under $200, featuring 99.9% accuracy, has been introduced by InterPath Corporation, Santa Clara, Calif.

VoiceCommand C25 allows personal computer users to verbally operate virtually any program written for the IBM PC. The system helps both experienced and novice personal computer users access popular word processors, spreadsheet programs and data base systems. VOICECOMMAND allows the computer to recognize and accept the user's voice as an alternative to keyboard entry of commands and data.

VOICECOMMAND users define common commands such as "Load File", "Print" and "Create Graph", all of which remain in the system for future use with any software. Additionally, common verbs, nouns, numbers and names can be defined and spoken to significantly reduce the time and complexity involved in the computer's use.

VOICECOMMAND has a "menu option" whereby users define voice menus, thus replacing those of standard software. Furthermore, the menus can be linked together to form a complete voice system, allowing inexperienced software users to apply simple terms to access and utilize the system.

The VOICECOMMAND system includes the software, microphone, plug-in board and instruction manual. Available directly from InterPath, the system sells for $199.

For more information contact InterPath Corp., 4423 Cheeney Street, Santa Clara, CA 95054; (408) 988-3832. •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**Central Point continued from page 178**

fying along the way (since the defaults include verification, a parameter you can change).

An associate confirmed that the board also readily copied the new version 1.1 of Framework and of dBASE, although unable to do so for version 1.0, as the board will not work on programs protected by physical damage to a diskette.

Rather than jump to the other obvious program choices (Lotus 123, Symphony, the big graphics packages, etc.) which have been tested by Central Point and still other reviewers, I decided to try to do something wacky and duplicate Picasso, a graphic drawing program exclusively for a Sanyo 550 series MSDOS machine. Since this Sanyo model is not a true compatible, I did not know what to expect. Copy II PC had previously been unable to reproduce this disk, since a key disk seems to be needed, and I had not been successful, even with its NOKEY program. I was unsuccessful in the attempt with the board, which was a surprise, considering that the board has been reported to be able to copy even some foreign disks, such as Apple and Atari, right on your PC. In fairness to Central Point, I made just two or three attempts (with different parameters each time) at duplicating Picasso, so it is unclear as to whether the problem lies with the board, the fact that Picasso is for a half-foreign computer, whether the program is more cleverly protected than others, whether I had to use different settings, whether the Tandy 1000 has problems not found on the IBM, or whether the original disk has physical damage designed to impede duplications.

Some suggestions made by the company in case of difficulty may resolve a problem. These include reversing source and target disk drives, and changing parameters (keep track length, verify, copy across index, use weak bits, end at later track 29 hex instead of 27 hex, etc.) I've also already indicated that Central Point Software specifically advises that it cannot help in cases of deliberate physical damage to the original disk, as happens in some programs such as version 1.0 of dBASE and Framework. Although I'd be reluctant to recommend the procedure casually, the manual shows how to make a hole in your target diskette to duplicate the damage so as to at least give you a chance to allow the copy. Has any reader with the board tried this and succeeded?

For advanced users, the disk also contains a track editor program, TE, or Transition Editor. It won't help you copy disks better, but it might help you analyze copy protection schemes should such be your interest. Its purpose is to allow you to look at data on any track in hex or ASCII, modify data on any track (not for the fainthearted!), look at the sector IDs on any track, and look at both data and clock bits. It is not necessary to use or understand TE to use TC and the board, however. Nor, for that matter, is it necessary to understand any of the theory behind copy protection to exploit this hardware/software combination effectively.

Finally, the board's manual has additional information for software publishers who may wish to use other esoterica such as autoloaders. Central Point Software also encourages users to inform it of user successes and failures with the board, with a view toward customer support and upgrades of the TC software—and perhaps ultimately, the board itself.

### Summary

The Copy Board succeeds. True, it won't copy every piece of software, but it will indeed copy most, including the software that most users want to backup: their spreadsheets, word processors, database managers, etc. Since I've installed it, I doubt whether I'll go back to software-only duplication, and I intend to leave the card in permanently. At under $100, with many companies asking $5 to $30 for a backup disk, I rate Central Point's board a very good value for what is, unfortunately, an almost essential utility.

Copy Option Board, $95.

Central Point Software, Inc., 9700 SW Capitol Hwy., #100, Portland, OR 97219; (503) 244-5782. ●


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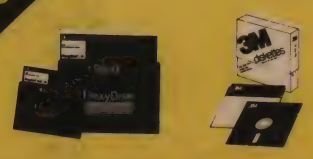

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C.O.D.

**Beautiful Dreamer continued from page 211**

1200 kept in my Penn State University office. To be brief, I found that the Dreamer performs exactly as advertised, and flawlessly. The unit appears completely invisible to the computer. By the use of a half-dozen "pages' numbered 0 through 5, you select the application you wish from among the seven supported. When the computer is turned on, the Dreamer defaults to page 0, meaning set up for Lotus 123 and Wordstar commands. If you are going to use another application, you select the new page number and add a plastic overlay template (provided) for that application so you'll see which commands correspond to which keys, beyond the commands standard for all applications.

All told, there are over 580 commands altogether spread over and for the seven programs supported, with 100 for Lotus 123 and nearly 200 for Symphony.

Of course, as helpful as it is, the Dreamer is not going to be perfect for all users. Because it is strictly hardware, it appears to be unexpandable directly by the user himself, although the producer considers the product flexible—and offers custom programming services—since it can change the programming. It would have been nice to have a means for an individual to program the Dreamer to add other commands. I'm not saying that I personally found any major oversights, but more intensive users might have a wish list. If such an option is available anywhere in the 60-page manual, I did not see it.

In fairness, however, I should mention that the company marketing the product has also promised to expand its coverage to other major business applications, thus broadening still further the base which will find this product appealing.

There is one aspect to the Dreamer that could tip the scales in favor of a purchase decision: learning and training. For example, a person using the Dreamer in conjunction with 123 need not learn all the "/ commands" of that Lotus product. Products such as Word Perfect, which are command-driven, not menu-driven, seem an even more obvious candidate, given the fact that this is not an easy word processor to tame. Hence, there is the promise of doing more since the user can learn much more, a selling point that has not been lost on T. S. MicroTech. It may well be that data-entry personnel can be trained cost-effectively with the Dreamer so as to more than justify the $259 purchase price.

Left-handed individuals may also find the concept attractive since they may position the unit with its numeric keypad in a manner more appropriate to a southpaw.

In practice, I found that the Dreamer operates more effectively than software solutions for another reason: Unlike key macro programs (which have to be loaded each time, don't forget), the Dreamer's commands are labeled on the unit and the templates. Will you always remember how you programmed Prokey or SuperKey so as to do each particular task?

### Summary

I like this product, even though I, as an individual who does not use these packages that often (just 123), might therefore hesitate to spend about $270 with the shipping. But for companies involved with data entry, training, and for writers and others actively involved with the software currently supported, the Dreamer can be a real godsend which could pay for itself in as much as a year or as little as a month.

The Dreamer, for IBM PCs, XTs, plug-compatibles, $259 plus shipping.

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**Amiga Workbench continued from page 104**

ly an act of faith, for the only things you took with you were Workbench, Kickstart and Kaliedoscope. Many of you were unhappy that you didn't at least get the Workbench Demos disk, which contained most of the neat things you'd seen, but in the end it really didn't matter.

For the only thing that even came close to the vision of the Amiga was "Bounce"—and how often could you have entertained yourself or your friends with a bouncing ball?

In retrospect, those early routines were beggarly—even though they knocked our socks off at the time. Could you really watch the short loop of "Robo City" and extrapolate ARCTIC FOX? Did "Bounce" in any way foreshadow MARBLE MADNESS? And did a computer salesman really have the nerve to ask you to watch the three graphics routines and imagine you were multitasking a word processor, spreadsheet and database? (Well, yes...If you were in my store, I probably asked you to so imagine.)

The point is that you were shown these things because there was nothing else to show. One year ago if you wanted software you either wrote it yourself or waited until a friend gave you a copy of a public-domain terminal program so that you could download software from bulletin boards.

Probably no other computer has come to market with absolutely no software—even the Macintosh had two programs bundled with it—and probably no other computer has had such a broad base of applications built for it in so short a time. Looking at our list, we find about eighteen separate categories of software (though some may argue that an original game, a simulation and an arcade adaptation are not separate categories in this sense).

And although some categories are of shallow depth, most of them offer you a choice: there are several word processors; several spreadsheets; several databases (though still no good business database); several painting programs and on and on.

I don't think we're near the targeted amount of software that Commodore and it's distributors had projected for this point in time—some companies folded while still in the "vaporware" stage, others chose to put their eggs in other baskets—but we're still in pretty good shape. Think of anything that can be done with

**continued on page 215**

**Amiga Workbench continued from page 214**

a microcomputer and you can probably find software to allow you to do it on the Amiga. Contrast that with the state of affairs that existed for the Macintosh at a similar milestone and the Amiga is looking good, indeed.

At any rate, that's it for my selection of Best of the Best and if there isn't fodder for at least a few disagreements then it's because you started reading in the middle of the column. Go back to the beginning and try again. While you're doing that, the rest of us will look at a few new programs that may someday turn up on another "Best" list.

### Marble Madness

..is already on our list as being the best (and so far only) transportation of an arcade game to the Amiga. Essentially a maze game, MADNESS uses the graphics abilities of the computer to construct a series of mazes that exist in three dimensions. As you guide your marble through, you'll find yourself going up, down, around, under and over pathways and obstacles—and in constant danger of falling off a path and shattering (or of being bumped off by a "steelie" and suffering the same fate).

After booting from Kickstart, MADNESS allows you to choose a level of play and then gives you a sample maze. As a single player you race against the clock, trying to complete the maze in the time allotted you by the game, while with the two-player option you can race against a friend.

When you crash (and you will) a whisk broom sweeps your remains from the track and you are reincarnated at the point where you left the track. Though there seems no limit to the number of times you may crash, such accidents do slow you down and in costing you time also cost you in scored points.

MARBLE MADNESS requires 512K of RAM and is available from Electronic Arts at 1820 Gateway Drive, San Mateo, CA 94404 at a suggested list price of $50.00.

Also new this month is:

### Adventure Construction Set

Redesigned from the Commodore 64 version, CONSTRUCTION for the Amiga boasts better graphics and sound as well as more built-in games (in case you don't feel like constructing your own).

Oddly enough, it seems you can do nothing with the master disk, not even play one of the built-ins. To do anything at all, you must first transfer modules or games to a "creator" disk and work from there. I found this a bit tedious, especially when I wanted to play the game based on "Alice in Wonderland" and couldn't find it anywhere.

For those who enjoy graphic adventuring, however, all the parts are here that will allow you to create your own with over two hundred rooms, over three hundred text messages, three hundred props and five hundred creatures per adventure. In addition to this, you have music and sound effects, wardrobes and special effects.

Play of the adventures, your own or those built-in, is by joystick. Pressing the fire button will reveal a menu of choices for your next move, thus saving you from typing in commands and dealing with a parser.

Although I am personally lukewarm regarding ADVENTURE CONSTRUCTION SET, don't let my feelings throw you off. I cut my adventuring teeth on Zork and still enjoy matching wits with a good parser. If you enjoy computer adventuring, you'll probably find this enjoyable as well—especially in the chance to create an ideal scenario and course of action.

ADVENTURE CONSTRUCTION SET, requiring 512K of RAM, is available from Electronic Arts at a suggested list price of $39.95.

No lukewarm feelings apply to the next offering, however, for it is:

### Archon II: The Adept

Although this one was also created for other computers, the translation to the Amiga results in fabulous beings looking like fabulous beings instead of icons; animation that flows smoothly over the game board and arena; and stereo sound that lets you hear every flap-

**continued on page 216**


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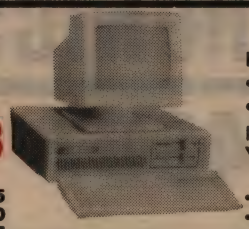

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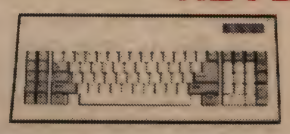

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**Amiga Workbench continued from page 215**

ping wing or stamping foot.

As in the original Archon, the forces of Light and Dark are at it again, battling for power points on a board. Occupying the same square as another piece causes that square to expand into an arena where you'll do personal battle (via joystick) against the foe you challenged. Since characters have different strengths and weaknesses, you'll want to be careful who you antagonize.

You are, after all, dealing with Gorgons, Firebirds, Wraiths, Sirens, Juggernauts, etc. At the same time, it is only fair to warn you that nice guys finish in a puff of smoke (or worse). ARCHON II will challenge your arcade skills as well as your abilities in strategic planning and is available from Electronic Arts at a suggested list price of $39.95. 512K of RAM is required.

Abilities of a different sort will be tested and improved by:

### Keyboard Cadet

Once again we have a program originally written for another computer, but KEYBOARD CADET has been rewritten to take advantage of the unique graphic properties of the Amiga and as a result becomes better than ever.

From the flight deck of your space ship, you select whether to Choose a Mission, which allows you your choice of any of the fifteen typing lessons included on the disk, or Cadet Training which will take you through the missions in proper order. Because it uses a "Hall of Fame" to track scores, CADET will remember your missions from one session to the next and, if you've completed lesson five, will automatically start you at lesson six.

With a Cadet mission chosen, the screen changes. The upper half still shows you a view of space with a kind of radar grid superimposed on the center. The lower half duplicates the Amiga keyboard, complete with a transparent pair of hands with fingers resting in the home key position.

For your first mission, the letters and semi-colon of the home keys appear in space and rush toward your ship. At upper left, a timer begins counting down from five seconds and you must press the key representing that letter in order to vaporize it before it reaches the center of the radar screen.

As this is happening, the proper key is highlighted in yellow, while pressing the wrong key causes that key to be highlighted in red. It will stay that way unil you press the proper key.

Following the attack of single letters, a hostile "mother ship" appears in your viewscreen and must be vanquished by typing a series of letters or short words. In Cadet Training, your score is kept as in an arcade game, based upon how quickly the rushing letters are vaporized, and the score bears no relation to typing speed. However, other lessons will present you with your speed and it is interesting to see how you improve from one session to the next.

Later lessons in the series will have you typing words, sentences and paragraphs. In lessons 14 and 15, sentences and paragraphs, you choose between "typewriter" and "word processor" modes, the difference being that in the typewriter mode you must press "return" after each line.

KEYBOARD CADET allows you to choose between three speeds of attack, thus allowing you to progress as you think you should. If you're doing well in Fast mode, go ahead and try HyperFast to see if you're ready for it.

In addition to this, you may choose whether to use the QWERTY or Dvorak keyboard and if you're into Dvorak you're on your own so far as keycaps are concerned for none are provided with the software.

Because touch typing is a series of conditioned reflexes, you must drill and drill and drill again if you are ever to learn it. That should be obvious, but it seems many people think a computer typing tutorial will get them up to 60 words per minute overnite—and that just isn't going to happen (unless you're already typing 59 words per minute). Fortunately, the arcade style of KEYBOARD CADET helps to hide the grind of constant drill with extremely good graphics, animation and sound effects.

KEYBOARD CADET, requiring 256K of RAM, is available from Mindscape, Inc. at 3444 Dundee Road in Northbrook, Ill 60062 at a suggested list price of $49.95.

That's it for this month. Letters should be sent to the writer in care of *Computer Shopper*, P.O. Box F, Titusville, Florida 32781. ●


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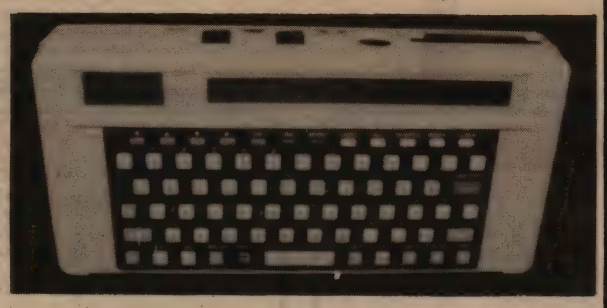

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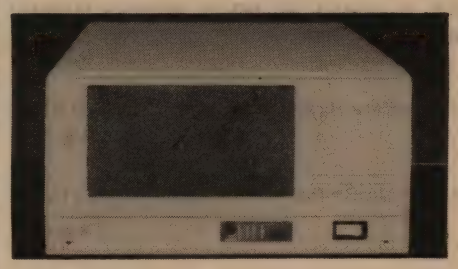

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**Lattice C continued from page 104**

pilation or length of object files.

In favor of Lattice, it must be remembered that this was the company chosen by Commodore to develop a C compiler for the Amiga. Consequently, Lattice C has been around longer than the competition and early bugs have now been corrected.

The natural size of integers on the Amiga is 32 bits, and this convention is followed by Lattice. Developers of the Aztec compiler, for reasons best known to themselves, use 16 bit integers.

Lattice is one of the oldest, if not *the* oldest, C compiler producers in the personal computer field. Consequently, Lattice C has a wide-ranging distribution, from microcomputers through minicomputers and, yes, even on some mainframes. If your concern is with porting a product to as many machines as possible, Lattice would seem to be the better bet.

Cost is also a matter to be taken into consideration. At approximately half the cost of the competition's lowest cost compiler, Lattice offers a more modest entry fee to the world of C language programming, particularly if, like many, one desires a trial run before committing one's self to the language.

The current version of Lattice C is 3.03. You'll need an Amiga with 512K and two drives, and the price is $149.95.

For further information, see your local Amiga software dealer or contact Lattice, Incorporated, P.O. Box 3072, 22W600 Butterfield Road, Glen Ellyn, IL 60137. ●

# Omega File Database For The Amiga

by Ervin Bobo

In it's short history, probably no category of Amiga software has spawned as much "vaporware" as has the database. And now that a good, medium power program has appeared, we must say that it all but damns itself by faint documentation.

In fact, I'm not even sure it can be called documentation: In order, beginning at far left, every menu and every option on each menu is treated to a few lines of definition. Unfortunately, the sequence of options is not the same as the sequence of operations in which Omega File is used and there is little to show how the options interact, leading to a curious case of explanations without instructions.

As an example, on page 10 you learn that the "Create" option will allow you to create a new database. . . . and eventually, on page 64 (more than halfway through the manual) you may learn how to enter information into it. On that page the "Append" option is defined as being that which will move you to the end of your database and allow new records to be added. Fine, but you're at the beginning and until you get that first record in it is impossible to append anything, right?

No, even the first record must be appended, but appended to what is a question for those philosophers who have done with irresistible forces, immovable objects and the like.

I've gone into detail on this hang-up because it is symptomatic: Although familiar database functions are used throughout, someone decided to give them unfamiliar names and then write an inadequate translation. "List Report" is what we would normally call a report, while "Page Report" involves you in the mail-merge function.

Nor is there any indication that invoking certain functions will flip you to an entirely different screen. Or so it seems. What really happens is that all startup menus disappear and are replaced by a small number of submenus, but knowing this does not lessen the effect of sudden dislocation and it may take you just a while to find where you are and how to get back to where you were.

With all this carping, you may well wonder whether Omega File is worth pursuing and the answer is a qualified yes. If you've used databases before, then you will eventually (in one or two evenings) be able to make the translations necessary and enjoy the use of a good, medium-power database/mail-merge program.

(According to the producing company, Omega File in it's present form is aimed at the experienced user of databases and the documentation is considered to be a reference manual.)

If, on the other hand, you are a rank beginner, you'd better find a friend who understands the use of a database and invite him to visit your computer room. And bring a lunch.

To return for a moment to the creation of a record. It is easiest if you've given thought to what you wish to include in each record. Then, when the requester window appears, you simply answer prompts concerning field title (Name; Address; Color Hair; Color Eyes; Measurements), type (text; integer; numerical) and length of field. Due to the use of the window and the fill-in-the-blanks method, building a record structure for your files is both quick and easy.

If you didn't think it through, Omega File allows for both insertion and deletion of entire fields through the "Edit" function, as well as renaming of fields. However, because reports are based on field names such changes may necessitate rewriting report routines.

Under this method, only field positions and names can be changed if you already have data in a file. Should you need to change type or length of field under these circumstances, you can rewrite your form and then transfer your data to the new database. This is possible because Omega file allows you to have open two databases at once, specifically for transferral of data.

(For the opening of two databases, 512k is required. Other than that, more or less machine memory seems to have no effect on the operation of Omega File, since each record is written to disk as soon as you finish entering the last field. This is a useful routine in that it guards against the loss of newly-entered data in the event of a system crash or a sudden power outage.)

As creating a template and entering records is the easiest part of using a database, so creating reports is the most difficult. Here, however, once you determine that "list reports" is the option that will get you started, the rest is fairly easy.

Again, prompts lead you all the way through, asking for such information as field, field length, headings, whether or not to invoke math functions on numerical fields, etc. While you are providing information for each field to be included in the report, a text file containing your parameters is being written in ASCII.

In itself, this is perhaps not strange, but we were surprised to find that the file is being written by ED, the text editor that is a part of AmigaDOS. Should you not like ED, or should you find it's commands unfamiliar, you may write and edit your reports with TextCraft, Scribble! or, presumably, with any other word processor that has the ability to save your work as an ASCII file.

ED is also the method used when creating a document to be used in the mail merge function—if you are unfamiliar with that term, think of it as the kind of personalized form letters you get in your junk mail. (Yes, ladies and gentlemen, now YOU too, can...)

Well, that is what it's for, so there.

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continued on page 218


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**Omega File**
**continued from page 217**

vironment, however, there is need for mail merge functions and Omega File seems to perform them well. In fact, the only parts of the documentation that give step-by-step explanations are those dealing with this part of the program. Perhaps the database, good as it is, was simply an afterthought.

In reporting, you can print to screen, printer or disk and the screen option shows how it will look on paper while there is a chance to change it or reformat it. Before printing to any of these, you'll be prompted "All or Search ?"—All will print everything in your file while Search will print only those specified—and this brings up one of the most powerful features of Omega File.

Imagine your file is filled with proper information so that, out of the imaginary thousands of records, you could build a report that would print out only those girls who have blond hair, blue eyes, tend to wear white shorts and say "yes" often. If that sounds impressive, consider that such a sort is only on four fields or "four deep."

Omega File allows as many as 256 fields per record, with up to 200 characters per field—meaning that your data on those girls can be exhaustive—and up to 32000 records per file—meaning that you are probably exhausted—and it will sort up to twenty fields. So if the blonde you really want to locate is also the one who makes great chili, has freckles on her nose, moans when you kiss her ear and sometimes calls you "Fred" (even though your name is Paul)...

Such searches can be made from the pull-down menu in response to the prompts for type of comparison. "At" looks for an isolated string of characters, while "In" looks for that string anyplace in the field. Specify the search item (blonde); At or In (At will find blonde, In will find honey blonde and strawberry blonde as well); the field where the information is to be found (COLOR HAIR); and the terminator of the search (END will find the blondes, And allows you to add the second level of your search, such as COLOR EYES).

In addition to those mentioned, your search options include comparators and these will be familiar to anyone who has written a BASIC program, for they are the standard math comparators: =, <, >, <=, >=, and <>. This works because text files are translated into numeric values in the ASCII decimal code, but you needn't concern yourself about that.

To report on a girl named Bonnie who lives in Tulsa, your request would be ("NAME"> A and "NAME"< C) then ("STATE"> N and "STATE"< P. Unless you know a lot of girls in Oklahoma whose names begin with "B," this should do it. Otherwise, you'll have to put a finer point on it such as ("CITY" = TULSA).

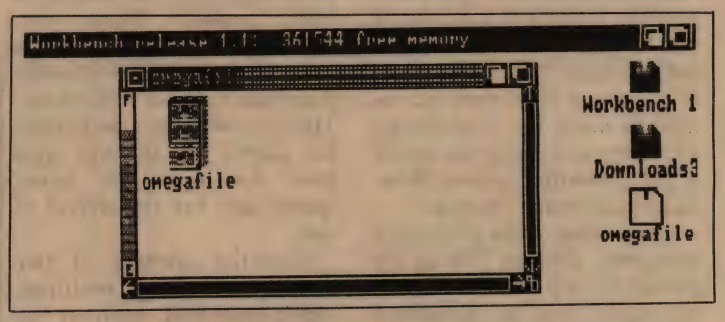
The operator AND is also supported in the search function, so if you want to line up an alternate date in Oklahoma City....

Although Omega File has the sorting, searching and math capabilities that would make it useful for such business purposes as invoicing and check registering, we could not recommend it for these applications until and unless the user has done enough experimenting to be sure he understands the workings and is in control. This is standard advice for any business use of any program, of course, but in the case of Omega File the advice needs special emphasis.

To repeat, this hesitancy stems not from Omega File as such but from the sketchy documentation (and from the fact that the organization of the information does not allow for quick reference); once this is cured, it should be a very good and useful program for those who need something more than an address filer and something less than Dbase III. We should also mention that the title screen of Omega File is in residence behind your working screen so that clicking on the "fore/aft" gadgets will bring it up and allow you to see the number to call for help when you can't figure out how to append a record to the beginning of a file. The Other Guys were thoughtful in this, but don't be surprised if the line is busy.

In fairness, it should be noted that a tutorial manual for Omega File is in the works. Projected price for the manual is $20. Add that to the price of the program itself and you still have a good and powerful database for the Omega at just under $100—and that makes it still a bargain.

Omega File is available from The Other Guys at 55 North Main St., Suite 301-D, P.O. Box H in Logan, Utah 84321 and at a suggested list price of $79.95. ●





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# IMPACT! Business Graphics For The Amiga

by Ervin Bobo

With the introduction of the third piece of their structure (or the fourth, depending on whether you count DRAW) Aegis Development has announced the concept toward which they've been aiming all along. It is called Desktop Video and while it is not meant as a replacement for desktop publishing, it does do an end run around the latter concept by providing an alternate medium for the conveyance of graphic information.

By allowing the creation of runtime disks to show off your creations, Aegis makes it possible to deliver the finished product to wherever there is an Amiga, whether or not they have the master IMPACT program—and if there is no Amiga handy, bear in mind that the finished product can easily be transferred to videotape—either method delivering your message in the form of outstanding graphics.

Although the person who uses the Amiga only in the home may not be thrilled by IMPACT, it is a must for anyone in business who must deliver a sales and/or financial message in a way that will grab and hold the attention of the audience and, in the process presenting dry figures in a lively manner that leaves no room for misunderstanding. This is especially true for anyone who has ever tried to communicate with the almost colorless (by comparison) charts that are created with programs such as Lotus 1-2-3 or PFS: GRAPH.

The uses of IMPACT are in three major parts: building a graph; creating a slide of the graph; and creating a slide show. The first two functions are a part of the main IMPACT program. To create a slideshow, you must return to the Workbench window and open the SlideShow program. It is in treating SlideShow as a separate entity that you are allowed to copy only that portion of the program for distribution as a runtime disk.

(Besides creating runtime disks, the entire IMPACT disk can be copied or can be installed on a hard disk: Aegis' stated philosophy in allowing copies is to provide the user with a hedge against stalled output due to a crashed master disk. At the same time, they hope the sheer volume of documentation for their programs will discourage unauthorized distribution of copies. If that is the price for continued excellence in software, we should all be for it.)

The work screen for IMPACT is the familiar black of art programs for the Amiga and the differences first become apparent when you begin pulling down menus and examining the tools and the options.

It would be possible to use the shapes and freehand drawing tools to create a graph, but the value of IMPACT is in having the program do the work for you. Select the graph builder and a requester window presents a chart into which you enter labels on the left and numbers on the right. Then select the type of chart: Bar, Line/Area, Pie, 3-D Pie. Almost immediately, your chart is an accomplished fact, complete with labels in the proper places. (See Figures 1 and 2 on page 220).

At this point, you can move labels around through a combination of the Edit and Region commands; you can resize the graph, or you can add more text with one of the several fonts—and the surprise here is that they are not the fonts from Notepad, but a set of fonts that better lend themselves to commanding attention as well as being read at a glance.

The next step is to convert your graph to a slide. This has the effect of preserving only that part of the total image that you designate with the rubber band frame. Before saving to disk, you still have the options of adding more text or embellishing with further drawings and shape placement.

If this were all, it would be enough. But IMPACT adds an Icon builder that, used imaginatively, can add even more zap to your charts: one of the demonstration charts provided shows the population growth of Hamburg presented in the form of a bar chart. Through use of the Icon builder, the bars are made of stacked hamburgers and because the limits to this are those of the imagination, the possibilities are probably endless.

Pie charts may be opted for in either 2-D or 3-D, exploding or non-exploding; bar charts may also be 2-D or 3-D and may be vertical or horizontal; line, area and scatter charts are also available and, with the exception of the pie chart, all may be used to display multiple data samplings. As an example, the bar chart above might be used to compare two decades of population growth and each set of data would appear in bars of a different color.

In the matter of text, you have five fonts from which to choose, most of them available in eighteen point sizes, and all of them capable of being enhanced by the use of options such as italics, bold, shadow, outline and underline. The text option also offers right and left justification and centering.

All your options come together in final form in the SlideShow, for this is where you'll select the order in which your stored slides appear on the screen as well as the manner in which they appear. Because the SlideShow is totally controlled through requester windows, the process becomes as easy as can be imagined.

First, a directory of your stored slides appears in a directory window. Below this is the SlideShow Edit window. Click on the slide you want to open your show and the title appears in the SlideShow Edit window.

continued on page 220

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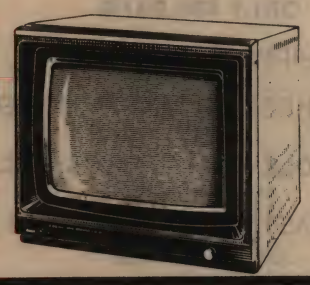

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**IMPACT!**
**continued from page 219**

Next you choose how you wish it to appear, appearing from top or bottom of screen; from left or right; spiralling in; trickling in; fading in.

Choose also the wipe delay, which is how long it takes for something to fade in, as an example; and choose the pause delay—how long the slide should appear on the screen. Then choose how you wish it to leave: fading out, spiralling out, etc.

Trickling builds your picture by seeming to drop elements of the slide as though they were snowflakes; spiralling starts your slide at center screen and draws out from there in a series of ever-larger concentric circles; another choice, random, brings your slide to the screen through a random turning-on of fat bytes.

Once this is done, choose the next slide and repeat all the steps. As you make your choices, they are being saved to disk and the limits to your show's length are the limits of disk storage.

Because storage is done in the Interchange File Format (IFF) and because IMPACT is the third leg in the Desktop Video structure, it will share images with both Images and Animator from Aegis and from Deluxe Paint by Electronic Arts—and if you have a knack for using these programs, then there is truly no limit to what you can accomplish with IMPACT.

As always with products from Aegis, the documentation is excellent and is well-illustrated. For those who like to dive into a new piece of software, the book begins with step-by-step instructions for building your first slide and only later goes into detail in explaining the steps taken. If ever there is an award for best software documentation, it should certainly go to John A. S. Keel for his body of work on Aegis products.

Though there are other Amiga programs with which business graphics can be created—any of the many art programs as well as Deluxe Video—the single-purpose slant of IMPACT will produce a finished product with greater ease and with greater variety in the presentation. For anyone who is ever faced with the task of turning raw and boring numbers into something that is easily comprehended—and that can even be made entertaining—we give IMPACT our highest recommendation.

IMPACT is available from Aegis Development at 2210 Wilshire Blvd., Suite 277 in Santa Monica, CA 90403 and at a suggested list price of $199.95.

In somewhat related news, Aegis has announced the publication of DRAW PLUS, a computer-aided design (CAD) program. This is meant to be an interim piece that falls between the capabilities of DRAW and those of the as-yet-unfinished Professional Draw.

Having listened well to user feedback after the release of DRAW, PLUS now incorporates the following new features:

When using the Dimension option, measurements can now be displayed as feet, inches and fractions (5' 3½")as well as in the original decimal (5.29') system.

Although custom plotter drivers could be written with DRAW, DRAW PLUS now contains a drawer holding drivers for several plotters, making this option easier to use, even to making paper size a part of the driver option.

Previously, the size of the background grid remained the same size no matter how many times you zoomed in. Now, as you enlarge a part of the drawing, the grid also enlarges and this is an aid in adding to the drawing while keeping to the same scale.

Dot-matrix printing has been improved, (see Figures 3 and 4). Figure 3 was printed from the Hi-Res version, Figure 4 from the standard version. Note especially the smoother curved and diagonal lines in Figure 3.

A mirror function has been added, allowing you to make a second image with only a few mouseclicks, and an array function allows duplication of a shape x number of times in a linear or circular direction.

A Hi-Res version of DRAW is included as a separate program and, though Aegis feels they have reduced screen flicker, I find it still bothersome (a white background makes flicker almost unacceptable. Do your drawings here with a grey background and, if you're using a black and white printer, switch to a white background just before printing).

To be fair, DRAW PLUS was designed around versions 1.2 of Kickstart and Workbench, which are not yet available. Because the start-up sequence of the disk contains commands not recognized by version 1.1, it would not boot on my machine. To make it work, I had to boot the computer with both Kickstart and Workbench 1.1, costing me about 90k of RAM and leaving almost no workspace in the Hi-Res mode. Hopefully, with version 1.2, we will see less flicker.

**continued on page 221**

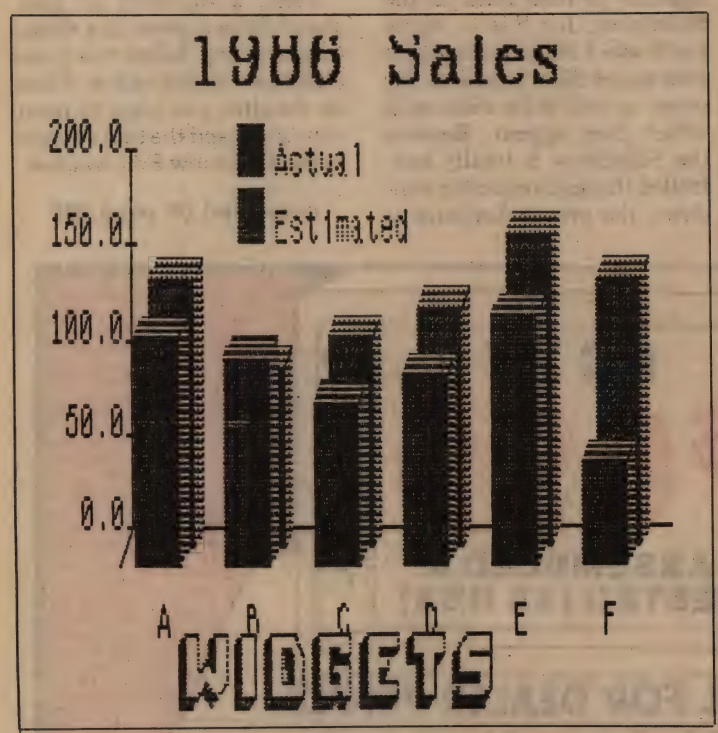


Figure 1

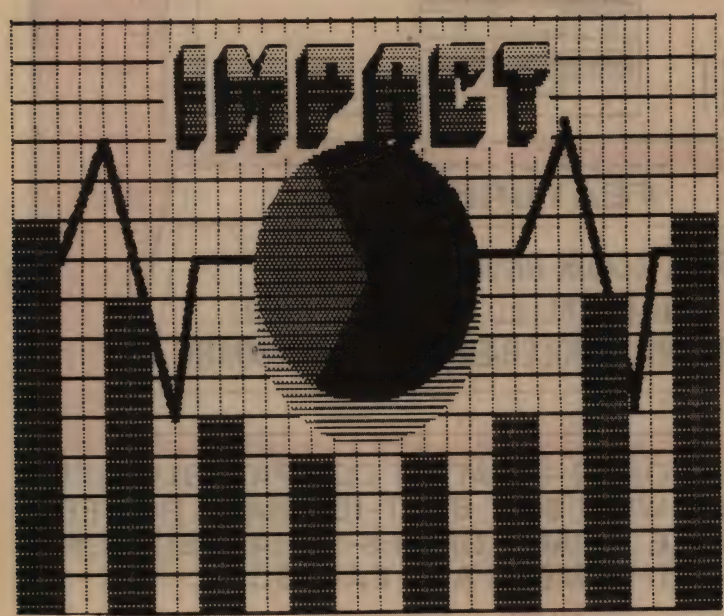


Figure 2

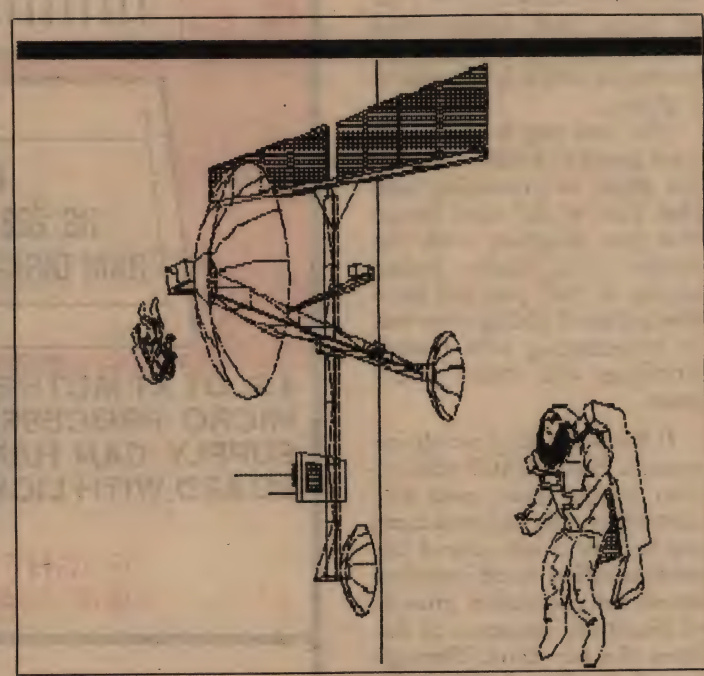

Figure 3

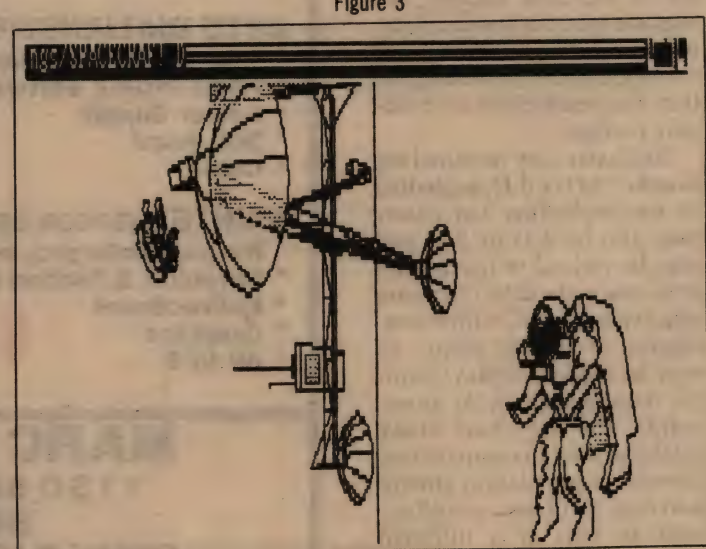

Figure 4

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# Super Huey Flight Simulation For The Amiga

by Ervin Bobo

What seems a long time ago, I picked up a helicopter flight simulator for the C64 that was called Super Huey. I hadn't heard of the company that published it and the somewhat garish packaging gave me some pause. But the price was only $19.95; I was desperate for something new to try on my computer; and the store where I purchased it had a liberal return policy.

I never took it back.

Instead, I fell in love with it; spent every morning for a month flying combat missions until it was time to go to work; got blown out of the sky more times than I care to remember; and enjoyed every minute of it. There are very few games about which I could say the same.

Now Super Huey has come to the Amiga, rewritten to take advantage of the superior graphics offered by the computer; enhanced in all the right places; and with a better user interface so that we can truthfully say it is the same game, but better.

As a simulator, Super Huey puts you in the pilot's seat of the UH1XA, an experimental high performance helicopter equipped with the latest electronic control and navigation devices and carrying enough firepower to level a small town.

The cockpit and instrument panel are drawn with fine detail and though there are many instrument displays, none are difficult to read. The view outside the window is less detailed: there are none of the "3-D" graphics of Flight Simulator even though some care has been given to rendering a feeling of depth and perspective.

The trade-off, however, is in speed: without the need for constantly redrawing the screen, Super Huey moves as you would expect aircraft to move, smoothly and swiftly. Instead of a constant updating of a line drawing of buildings or bridges, the designer of Super Huey opted instead for the use of sprites and blitter objects that sweep below your chopper to give a feeling of real speed and movement.

To enhance the idea that this is more simulation than game, you are required to go through a power-on and warm-up sequence before each mission. You begin by sitting before a dead control panel. Select one of four missions by typing it in on the CRT that occupies the center of your panel, then type "POW"—for power. Instantly, the panel comes alive by lighting up all the digital displays and you hear the motor cough into life and steady out at 500 rpms.

Control is by mouse and keyboard, the mouse emulating the cyclic, collective and anti-torque controls of a real helicopter; the keyboard being used for arming and firing weapons as well as for navigation purposes. With the left mouse button depressed, drag your mouse to the left to increase rpms to 1500, then use the function keys to engage your rotor. After a warm-up, you're ready to go to 3500 rpms and begin to fly.

Now you press the right mouse button and drag the mouse toward you, much like pulling back on a joystick. The Super Huey liftoff is smooth and fast, buildings and radar towers receding below you in one of the most realistic sequences you've ever found on your computer. With the right button still depressed, shove the mouse forward. Now the CRT informs you that you are in a slight nose-down attitude and you'll see your airspeed climb from zero as you begin forward motion and ground objects begin sweeping beneath you.

Of the four missions of Super Huey, the first is a training mission. Here, the readout on the CRT leads you through a take-off, flight and landing sequence. You'll be advised where to hold your rpms, the speed and altitude at which to fly and the compass heading you should follow. Deviations bring an instant corrective response and if you get too far off the mark the result will be a crash sequence.

In the Explore Mission, your task is to map the terrain over which Super Huey flies. Though this may sound simple, it will require a definite plan in order to define your quadrants and fly them in a pattern that will be non-repetitive. To aid you in this, there is the compass and the CRT, which can apprise you of distance flown—thereby allowing you to fly the appropriate box-like patterns necessary for an overview of the terrain and later allowing for accurate sweeps through the boxes. Once you feel you've accomplished this mission, send a copy of your map in to Cosmi and they'll supply you with the real map of the territory that, by comparison, will give you a handle on your degree of accuracy.

Rescue depends even more on navigational skills: here, a military party is stranded in the wilderness and your job is to rescue them. Although they have a transmitter and signal flares, the transmitter is low-powered and the flares will be used only when they have sighted you.

To effect a rescue, you'll first need to fly search patterns until you pick up their radio signal on your homing device. Once you have the approximate heading, start taking distance readings on your CRT—these will tell you how close you are to the signals source. It is also well to fly low and slow so that you do not miss the signal flare that—if you've flown well—will arc in front of your windshield when you've finally entered the airspace over the lost team.

The fourth mission, Combat, pits you against other helicopters that are almost in your class—and since there are more of them than there are of you, you're going to have your hands full.

Further, you don't know where to look for these guys—they could jump you from anywhere. A vast improvement over the C64 version is the length of time that must pass before you can find and engage the enemy. On the C64, it seemed to take forever. In the Amiga version, it happens right away—probably they've been out looking for you.

You load and arm rockets by

**continued on page 222**

**IMPACT!**

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For the same reasons, I could not verify that more windows can now be opened in the 512k Amiga, but with DRAW the limit was two windows so DRAW PLUS should give us three or more and this should be of great benefit. In use, you might zoom in on a portion of your drawing to add fine detail, while keeping an overall view just a mouseclick away.

In all, over thirty changes have been made, bringing DRAW PLUS up several notches in ease of use and productivity. Because of the lack of Kickstart 1.2, I was not able to check out all the features, but even the ones listed above make the PLUS version worth a second look. As of this writing, it is the only CAD program available for the Amiga and it is a good one made even better. ●


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# Aegis Announces New CD-I Division

Aegis Development, Inc. recently announced the creation of a new Research and Development division, Aegis CD-I, for the upcoming new technology of Compact Disk—Interactive software. At "OutrAegis '86", Aegis', one-day Amiga event, company vice president of programming William Volk discussed the creation of this new technology, and the part Aegis will play in creating development tools and software for it.

Aegis has been working closely with hardware manufacturers of CD-I equipment to determine the man/machine interface (MMI) design which will be used to set industry standards for the software.

Development of this new technology is expected to be a two year project, but Aegis will have working demonstrations of CD-I software by the January 1987 Consumer Electronics Show in Las Vegas, Nevada.

Mr. Volk also offered a description of what CD-I will offer: "CD-I will provide more than just passive entertainment. A CD-I title could consist of a novel containing pictures and animations that is directed by the user. Unlike computer games, CD-I can support real digitized speech and digitized pictures in quality and quantity only dreamed about in the past." He also pointed out the need for new hardware requirements in order to handle the power of the software. "The CD-I player will also function as a high quality animation player. A CD-I flight simulator will contain photographic quality images of every major airport in the world. CD-I will also be a teacher, allowing interactive study for a multitude of topics. More than mimicking a book, CD-I educational titles will allow a high degree of interaction. A physics title would contain the usual equations found in a textbook, but also could simulate the entire lab for the course."

Aegis CD-I will maintain not only R & D facilities for software development, but will also provide an authoring studio through Aegis' Creative Services department. "Current programming systems cannot deal with this amount of information," stated Mr. Volk. "Aegis will use its experience gained with authoring systems (Animator™ and Impact™) to create a development station usable by the non-programmer. This is not just a convenience, but a requirement for this new generation of software that combines the video, audio, and computational aspects of development." The authoring studio will provide all the necessary hardware including state of the art video and mixing equipment, professional sound equipment, and computer systems, for making CD-I software, desktop videos, and a host of other professional high technology products.

In addition to these new facilities, Aegis CD-I will offer training seminars and classes, as well as hands-on instruction on the use of the available equipment.

Aegis Development, Inc.'s graphic-oriented Amiga product line is the first step in this company's creation of a new, "desktop video" marketplace.

Aegis' desktop video products include Aegis Animator, a metamorphic/cel animation program, Aegis Images, a 32-color paint program, Impact, a business presentation graphics program, and several Art Paks containing professional "clip" art and animation cels.

This professional graphics product line will be used in conjunction with the Commodore Amiga computer and video equipment such as Genlock, U-Matic and Sony Betacam video systems. Combining these elements allows the creation of inexpensive, quality video presentations.

This combination of products is ideal for such things as visual corporate presentations, sales progress and tracking, promotional video presentations, visual finance pro formas, or as an inexpensive alternative to commercial graphics for weather maps, sports animation, titling, and music videos. Once a video is assembled, a computer-generated presentation can be made without a computer by simply editing as one would a normal videotape.

For further information contact Aegis Development, 2210 Wilshire Blvd. #277, Santa Monica, CA 90403. 213-306-0735.

Mention that you read about it in *Computer Shopper*. ●

**Super Huey**
**continued from page 221**

two depressions of function keys one through four. Four rockets may be armed at once and when you fire one it is a good idea—if the enemy gives you time—to quickly load and arm another in the position just used. You have twenty rockets in all and, unfortunately, they are not heat seekers. You're going to have to "lead" your target in much the same way you'd lead a clay pigeon in skeet shooting. Coming close does count: if you get close enough, without making a direct hit, you can hope that the proximity fuse will explode your rocket at the right time.

As for the other twelve enemy choppers (there are thirty-two in all), you're going to have to rely on your machine guns. These have the advantage of being faster than the travel of a rocket but your aim must be dead on. It is pointed out, though not put forward as a suggestion, that chopper pilots in Viet Nam marked the point of gun convergence by marking an X on the windshield. As they say, it is not a suggestion, but if you wish to try it, go ahead. It's your monitor.

As a matter of tactics, I find it easier to zap the enemy when he is flying at right angles to my course (Oh, all right. He's also presenting his broadest dimension to me at that point.) When he's coming head on, the only thing to do is to throw your chopper into a steep bank and get out of his way—unless your reflexes are very good, in which case you might win the shootout. If you're like me, you'll find your windscreen full of bullet holes in the moment just before you crash and burn.

All of which will make you want to get back into the air and take them on again—or change to a more peaceable mission. Maybe you could go map some terrain while you think things over.

The sound routines for Super Huey are as real as the cockpit. The game begins with a title theme (in stereo) that has a rousing martial beat and that sounds just familiar enough to be maddening. But it is worth listening to and the titles it backs up are worth seeing every time you boot the game.

As you power up your chopper, the motor coughs into life, roars and then settles down. When you engage the rotor clutch, the sound is just what you've heard in the movies when chopper blades start whipping the air—slowly at first, then building and becoming more rapid until it is like the beating of wings. The moves you make to change engine rpms or to change rotor pitch are reflected in the changing sound, and it is these routines that add a great measure of realism to the simulation.

To increase your enjoyment of the sound, you may wish to invest in an inexpensive amplifier and a stereo headset. The one I use is the Realistic SA-150 from Radio Shack, but there are doubtless other good and inexpensive amps to be had. It doesn't take up a great deal of space and because of multiple inputs and outputs I still have access to normal sound from my monitor. Any stereo headset should work with this—and wearing one may even make you feel more like a pilot.

Documentation is good—so good that it becomes a short course in the aerodynamics and control of rotary-wing aircraft. If you're not really interested in those subjects, scanning topic headings will lead you to those sections most pertinent to getting off the ground and flying. Along with this, there is an easel-type quick reference card that you'll want to use until you become accustomed to the controls and the instruments.

As to the controls themselves—I would have preferred a joystick, even though I realize a two-button mouse is more flexible in handling the different routines encountered here. But, having opted for a mouse, why in the world did they insist on having it work from port two? Everything else uses port one and you never have to unplug the darned thing—which leads to a situation in Super Huey where everything seems to be working but you just can't rev the engine; until you realize you forgot to change mouse ports.

At any rate, that is the only shortcoming I've found. Other things, such as the view of the terrain, may not be as detailed as I'd hoped, but there are understandable reasons for why things are as they are. Which is a roundabout way of saying that the pluses of Super Huey far outweigh the minuses.

It is an excellent simulator with enough gameplay values to keep you coming back for more.

Super Huey is available from Cosmi, Inc at 415 North Figueroa St. in Wilmington, CA 90744 at a suggested list price of $39.95 ●

# Kent Engineering Introduced MacroModem

Kent Engineering & Design has introduced MacroModem, new telecommunications software for the Amiga. It is the first title in their new line of software called MacroWare, demonstrating the power of macros.

MacroModem greatly simplifies telecommunications for the experienced user and novice. MacroModem's efficiency comes from the user's ability to create sets of macro commands and companion help screens. One keystroke does the work of dozens.

The new MacroModem user can be on-line in minutes. An install macro assists the user in customizing the program. Another set of macros directs the log-on procedure.

Because of the power and flexibility of MacroModem's macros, one keystroke can prepare and execute a terminal session. One macro can include up to 35 keystrokes—function key commands, control codes, text, even other macros. A macro command can load a new set of macros from disk in seconds, making it possible to change from one set of macros to another, even while on-line.

Files of macros for each telecommunications service and task are easy to construct, using the MacroModem Editor and sample macro templates. And macro sets may be edited while on-line.

With MacroModem as a guide, the novice can advance to expert. In terminal mode, Amiga's function keys invoke 20 fundamental operations. Command mode includes more specialized commands, including access to AmigaDOS commands.

MacroModem cooperates fully with the Amiga's multitasking, multi-window environment. The entire current terminal capture file may be displayed as an independent task. On-line conference or electronic messages of up to 10 lines may be prepared and sent from the resizable Compose window. User-defined phone directories can also store electronic mail addresses.

For further information contact Kent Engineering & Design, 4215 Jordan Road, PO Box 178, Mottville, NY 13119-0178. 315-685-8237.

Mention that you read about it in *Computer Shopper*. ●

# Apple-CP/M

by Jesse Sheinwald

### The New Machine

By the time you read this the news should be quite stale, but it has finally happened: The new Apple II has finally appeared. What a machine the IIGS is! Graphics, sound, high-resolution color, 256K on the main board, high capacity power supply and potentially more available slots for special function cards. I can hardly wait to try one.

Certain cynics and philosophers say that life does not give you any second chances. It is the old opportunity knocking once theory. But wait! For those of us who back in 1977 were either too busy, ignorant, or young to take notice of that rather pricey, flat, cream colored box with the keyboard on it; the typewriter without the place for the platten and ribbon, this new II may indeed be a second chance. Those who were prescient and able to buy the first Apple IIs back then, were explorers of new, uncharted territory. Those who came later, although still able to learn and make discoveries, had to follow the lead of the first pioneers. With the new II, we all can now be wise; we all have the potential to be pioneers of a new, vast unknown territory. Granted, we won't have the innocence of the first Apple II hackers; those days are gone forever, but we will have the chance to hack something new. And this is the chance that may not come again.

### All Those Slots

There are seven slots in the new IIGS; eight if you count the memory expansion slot. As this is being written, it is not completely clear how all the slots will work. From an initial run with the machine, it appears—depending on how you configure your hardware—not necessarily all the slots will be available to you. For example, if you use the built-in serial port to drive your printer, you effectively lose the use of slot #1 for anything else. Again, we are still not far up the learning curve with the IIGS and how the machine really works; its limitations will become more apparent in time.

Historically, certain slots have always been used for certain thinGS, and these slot functions have become standard. Most notably slot #6 has usually been reserved for your disk controller and slot #1 has always been for your printer interface card. Many DOS 3.3 and ProDOS programs, and virtually all Apple-CP/M programs will not work or not work properly unless this is your hardware configuration. The IIGS obeys these conventions.

I will haunt my dealer over the next few months and try to avoid being thrown out learning more about the IIGS.

### Coprocessing

For those who are new to the game, a coprocessor is a special applications microprocessor that is installed in your microcomputer and is used for certain tasks that either you do not want to burden your regular microprocessor with, or to perform functions that it is incapable of performing on its own. An example of the former is the 8087 numerical coprocessor that may be used in most IBM-PCs and compatibles. An example of the latter is the Z-80 that is found on virtually all CP/M cards that are installed into the Apple bus.

Since the new IIGS sports standard Apple expansion slots, CP/M cards are bound to be one of the options for the new machine. However, the Z-80 card sporting CP/M may very well not become the most popular coprocessor and auxillary operating system for the IIGS. CP/M, while still being very powerful and useful, is not a growing system. I use my CP/M system every day, and while I have plans to talk about a couple of interesting CP/M only programs here in the future, I know enough to realize that the future of

continued on page 227


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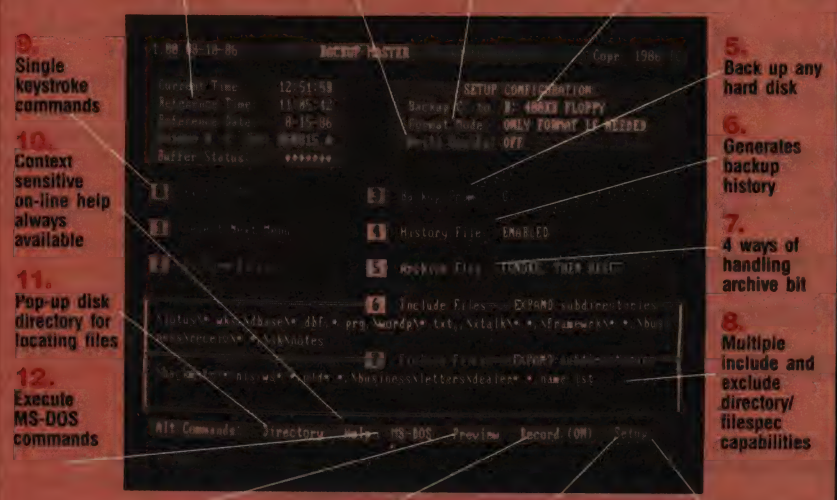


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**Apple IIGS continued from page 109**

ly the same expansion slots as the IIe.

Apple tested a large number of the best-selling Apple II software packages and found that more than 90 percent of them operate normally on the IIGS. Many run faster due to the system's increased clock speed. Some programs have only minor display or documentation differences. Programs that do not operate correctly fall primarily into two categories:

1) Communications software which requires an Apple II Super Serial Card will not operate normally with a modem plugged into the built-in serial port. The IIGS contains a different communications chip (the same chip that is in the Macintosh) than is found on the Super Serial Card in order to provide AppleTalk protocols, a wider selection of baud rates, and other enhancements.

Developers of most major communications software packages are revising their products to work with the new chip. A revision of Apple's own Access II program will be available soon. Users who already own a Super Serial Card may use it in the IIGS with existing software packages. Modems are not affected.

2) Programs that were developed outside of Apple's programming guidelines may not work correctly on the IIGS because of changes in certain slot characteristics. Owners of such programs should check with manufacturers for information on compatibility and upgrades.

The IIGS is compatible with nearly all printers, plotters, modems and disk drives that worked with earlier Apple II computers, as well as the majority of peripheral cards. Cards that must be plugged into the auxiliary slot on the IIe, however, such as many multi-function cards, will not work with the Apple IIGS. However, the IIGS has built-in many of the functions provided by these cards, such as extra RAM, RGB support, 80-column text, accelerated operating speed and a clock.

Following are some of the leading IIGS software and hardware announcements at press time.

### Software

#### Broderbund's Fantavision Creates Animation On The Apple IIGS

Broderbund's special effects/animation generator, Fantavision, has been designed to utilize the enhanced features of the Apple IIGS: superb color, super high resolution graphics and sound.

With Fantavision, any user, from the non-artist to the professional animator, can create studio-quality animated sequences accented by a library of digitized sounds provided in the program.

Fantavision incorporates two advanced computer animation techniques known as "tweening" and "transformation." "Tweening" means that the computer can create smooth, fluid motion instantly generating up to 64 intermediate positions between objects. This saves having to redraw shapes countless times as in traditional "cell" animation. "Transformation" lets the user create sequences in which an object in one frame can be transformed into an entirely new object in the following frame.

In addition to these advanced techniques, Fantavision lets the user superimpose Fantavision special effects onto super high-resolution backgrounds that are available on the program disk, or that may be taken from other Apple IIGS graphics programs.

Fantavision allows users to create special self-running show disks on which they can store cartoons and movies. This allows them to show their creations to other Apple IIGS owners, even if they don't own Fantavision.

Fantavision for the Apple IIGS requires one 3½" disk drive and 256K of memory. A color monitor is recommended. The program supports color printing using the Image Writer II. Suggested retail price is $59.95.

For further information contact Broderbund Software Inc., 17 Paul Drive, San Rafael, CA 94903-2101, (415) 479-1170.

#### Activision And Personal Choice Software Release Paintworks Plus And Writer's Choice Elite For New Apple IIGS

Activision has announced the release of two original software products designed especially for the new Apple IIGS computer system. Paintworks Plus, an easy-to-use creativity and self-expression tool, and Writer's Choice elite, a powerful but simple-to-learn word processing tool, will both be available for the new computer system soon.

Paintworks Plus and Writer's Choice elite were both designed for Activision by Version Soft, a well-known group of French programmers who have, in the past, developed several programs for the Apple IIc and IIe computer systems. Paintworks Plus, to be marketed under the Activision Creativity Software label, allows Apple IIGS computer users to produce multi-colored graphics which can come alive in animated sequences. The powerful color imagery brilliantly lends itself to the

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*See details on page 52.*

**Mite Goes Public continued from page 187**

the documentation.

I found Mini-Mite easy to use, in fact I used it first without reading the documentation. Since I was able to use the program without instructions, I feel that it passed the test for ease of use. But I needed to read to make full use of some of its features. The menu is straightforward (see figure 1) and the local commands are simple enough to learn quickly. An on-line help function is available for the full-price registration.

Figure 1
Mini-Mite Main Menu

```
MINI-MITE v4.09—Copyright (c) 1986, Mycroft Labs Inc.          11:48:59am
OFFLINE. Bytes Captured =          0/65520. Capture = OFF.
Site ID =
MAIN MENU

    G — Go Online                    E — Edit File
    H — Hangup Phone                 I — Enter Site ID
    L — Load Parameters              S — Save Parameters

    Z — Emulated terminal            = ADM3A

     Sub-Menus:

    P — Parameter                    O — Option
    U — Upload/Send Text             D — Download / Capture Text
    C — Command Processor            T — Timing Constants
    B — Binary File Xfer

    X — Exit to Operating System

Enter option (? for help):
```

For the price, Mini-Mite is a good product. The liberal upgrade policy should make it very popular with both hobbyists and those who need the additional features like the advanced protocols and terminal emulations to interface to mini computers and mainframes. With a real live company behind it, and a large installed base of Mite products, Mini-Mite gets a lot more support than the typical freeware product from both its publisher and users. Mini-Mite alone will not replace more robust products like Crosstalk but for the price it has a lot to offer.

Product: Mini-Mite Telecommunication Program, Publisher: Mycroft Labs, Inc., P.O. Box 4106, Tallahassee, Florida 32315, 904-385-1141, (800) MYCROFT (orders). Price $15 contribution suggested $25 for full technical support and manuals. ●

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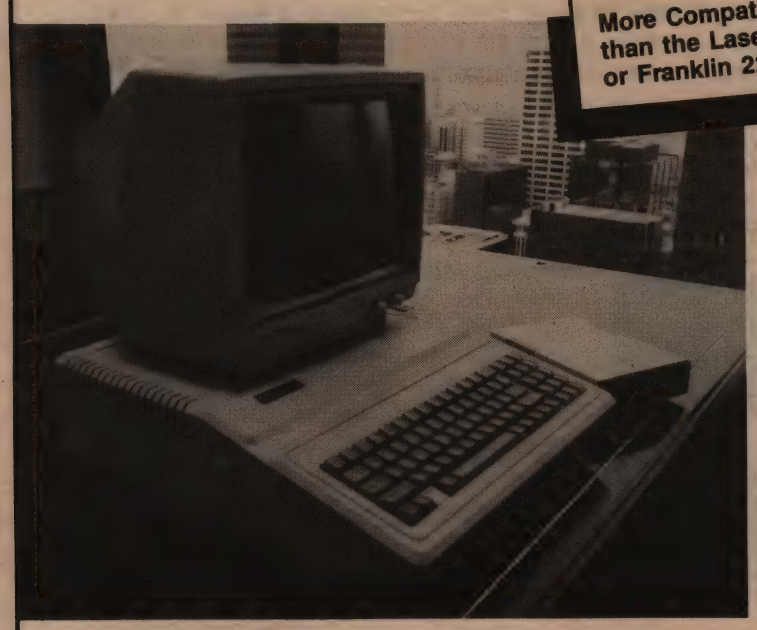

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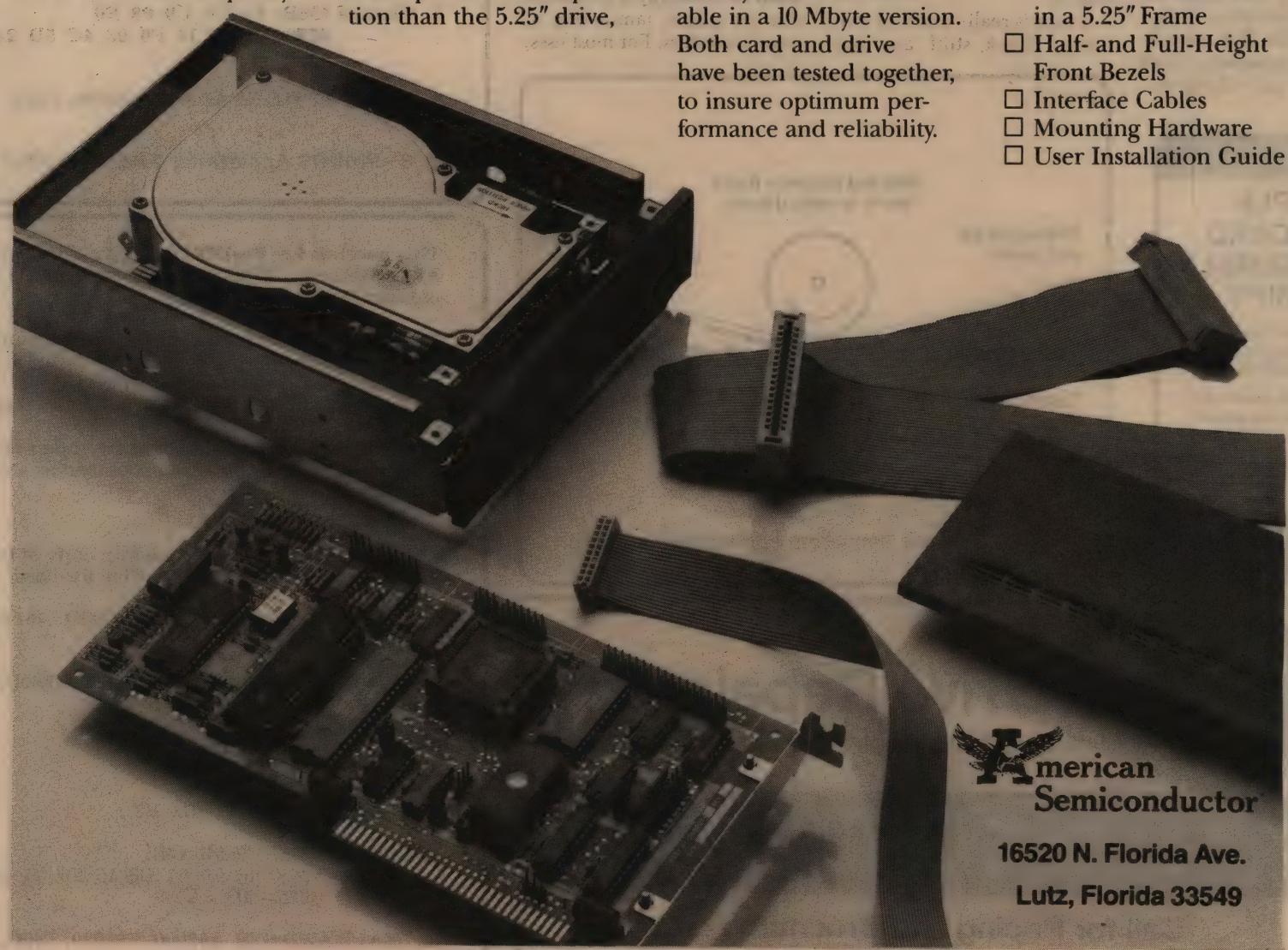


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**Ask The Guru**
**continued from page 110**

lems. This is similar to the ProDOS 2.0 GLOSSIFIER patch that appears in my *AppleWriter Cookbook*.

Figure 3 is a new SWALLOWIFIER patch used with ProDOS AppleWriter 2.0. This one eliminates the screen hassles when trying to swallow or barf characters to the left arrow/right arrow buffer. It turns out that this command used to have to go all the way through the glossary before it did anything. With long glossaries, particularly self-prompting ones, this extra trip time royally fouled things up.

The patch works by trapping out the swallow and barf commands before they have to go all the way through the glossary search process.

Figure 4 is the same SWALLOWIFIER patch intended for ProDOS AppleWriter 2.0.

Besides its slightly different location, note that 2.0 files are SYS type files, while 2.1 files are $0D type files.

Many thanks on this to Don Thompson. By the way, he has several new AppleWriter patches and utilities available.

I'm working on the patches for fast IIgs operation of AppleWriter, while Don is working on the automatic clock link. More on this whenever..

**So, Where's The Big Blockbuster?**

Patience. Patience.

I told you I would believe it when I saw it. I've seen it, I use daily, and I still don't believe it.

I don't think I was ever more amazed when Woody Baker of The Copier Store mailed me back one of my very own laser printed business cards—redone in real ink in an almost "embossed" gold! Turns out Woody had found an old Omnicrom machine or two scunging around unsold in the back of his warehouse and fired it up. Lo and behold, the instant conversion of any toner image to real ink in stunning colors!

The Omnicrom stuff has been a loser to date because the manufacturer was laboring under the delusion that you needed one of his $1300 heat fusion roller machines to use the Omnicrom process.

I got to thinking about just what their machine did, and concluded that it was no different whatsoever from the existing fusion rollers in the Laserwriter. Just for kicks, I shoved some Omnicrom sheets back through the Laserwriter and it fused acceptably well.

So what is Omnicrom, and how does it work? Figure 5 tells all.

Toner is really a mix of two things: black stuff and hot glue. Most people use toner to see the black stuff. Instead, you can think of any laser-printed (or for that matter, any xerox copy) as a sheet of paper that has had hot glue selectively applied in certain locations.

An Omnicrom sheet consists of a carrier that has a smooth layer of "real" ink applied to it in any of sixty colors. These sheets presently cost around 35 cents each, but any unimaged portion of any sheet can be reused later.

Once the word about the cubic goodness of this virtually unknown process gets out, you can probably expect competition and deep discounts. I predict the ultimate sheet cost will be under a nickel, maybe less.

What you do is take the laser printed image and put the Omnicrom sheet in contact with it. You then apply heat and pressure, usually in the form of rollers at 160 degrees C.

The heat and pressure melts the hot glue, grabs the ink off the carrier, and gives you a solid color ink where the toner was.

Which leaves you with a bright, real-ink image that is actually more durable than the original toner. Of course, for high wear uses, you may still want to overspray a fixative or else use plastic laminating or page protectors. For most uses, the durability is just fine.

There are at least three ways you can transfer the ink. As we've just seen, the Laserwriter does a reasonable job of this, simply by shoving the page back through while doing a hand feed of a blank image.

You could instead buy the expensive custom fusion machine, and this might be a good choice for high volume work.

Finally, certain of the Minolta copiers are set up to directly handle the Omnicrom material. In fact, any copier that lets you hand feed heavier stock should more or less work, provided it has a sane paper path.

Some uses: Business cards, badges, and bumper stickers are obvious, as are point-of-

**continued on page 228**

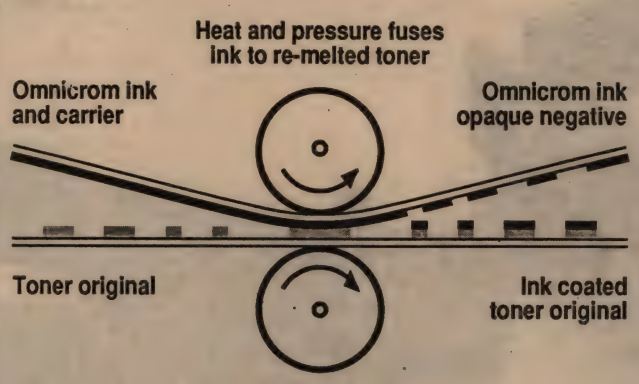


**Fig. 5 - How the Omnicrom color process works.**

**This patch is for ProDOS Applewriter 2.0 version AWD.SYS only. AWD.SYS runs only on the 80 column IIc or the 128K IIe.**

**The patch eliminates a complete trip through the glossary whenever an "open apple <--" or an "open-apple -->" is done, greatly clarifying repeat saves or restores of saved characters.**

**It works by trapping out these two open-apple commands before they are processed as glossary commands.**

1. **Make a third or higher backup copy of ProDOS Applewriter 2.1, using the filer utilities.**
2. **Get into /BASICS.SYS. Then CALL -151 to get into the monitor.**
3. **BLOAD AWD.SYS, A$2000, E$6020, TSYS, D2**
4. **Verify 2A5A- D0 01 60**
5. **Change 2A5A: 4C 6B 45**
6. **Verify 456B- A0 FF C8 B9**
7. **Change 456B: F0 0B C9 08 F0**
   **4570: 07 C9 15 F0 03 4C 5D 2A**
   **4578: 60**
8. **BSAVE AWD.SYS, A$2000, E$6020, TSYS.**

**Fig. 3 - ProDOS Applewriter 2.0 Swallowifier patch.**

**This patch is for ProDOS Applewriter 2.1 version AWD.SYS only. AWD.SYS runs only on the 80 column IIc or the 128K IIe.**

**The patch eliminates a complete trip through the glossary whenever an "open apple <--" or an "open-apple -->" is done, greatly clarifying repeat saves or restores of saved characters.**

**It works by trapping out these two open-apple commands before they are processed as glossary commands.**

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2. **Get into /BASICS.SYS. Then CALL -151 to get into the monitor.**
3. **BLOAD AWD.SYS, A$2000, E$6020, T$0C, D2**
4. **Verify 2A5A- D0 01 60**
5. **Change 2A5A: 4C 75 45**
6. **Verify 4575- A0 FF C8 B9**
7. **Change 4575: F0 0B C9**
   **4578: 08 F0 07 C9 15 F0 03 4C**
   **4580: 5D 2A 60**
8. **BSAVE AWD.SYS, A$2000, E$6020, T$0C.**

**Fig. 4 - ProDOS Applewriter 2.1 Swallowifier patch.**

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**Apple CP/M continued from page 223**

coprocessing on the Apple does not belong to CP/M. I know it says "CP/M" at the head of this column, but even the most diehard CP/M fan knows that the sun is setting over the CP/M system, and that much of the future of computing is going towards the world of the IBM-PC and PC compatible and MS-DOS.

We may be at the end of the golden age of CP/M, but the few million machines that run CP/M—including some 800,000+ Apples—are just not going to go away. They are going to continue to be used and be productive.

One of the interesting thinGS that my mail shows is the large number of people using older IIs and II+s almost exclusively on CP/M. As their systems have aged, and many of the new "power" Apple applications programs got written specifically for the capabilities of the IIe (and now probably for the IIGS), their CP/M cards kept their machines from being scrapped.

Many rumors are spreading about MS-DOS cards for the Apple II series. Since an MS-DOS coprocessor may be just the thing to keep older Apples alive in the future, as well as being a useful accessory for the present, a discussion of MS-DOS on the Apple II series is in order.

### A Short History of MS-DOS With Apple IIs

Back in the late seventies, when the Apple II was first coming into its own using earlier versions of the DOS 3.3 operating system, the major competitive operating system used on microcomputers was CP/M. Think back for a moment, on one hand you have the sleek, modular Apple in its beige plastic case with integral keyboard. On the other, you had the typical CP/M system of the day: A substantial, boxy card cage affair that contained a set of large printed circuit boards in what is still known as the "S100" bus. The unit usually had two (and for the time extraordinarily expensive) eight-inch floppy drives, and the entire thing was controlled by a video terminal that was about the size of an Apple II with drives and monitor. Those were the days before Osborne and Kaypro.

At that time, an early form of MS-DOS existed, but it was not owned by Microsoft and it went by a different name. When IBM introduced its PC in 1981, and adopted MS-DOS as its primary operating system, MS-DOS achieved a new importance and legitimacy. In those innocent days, the IBM-PC was initially looked upon as sort of a "hotter" CP/M machine. The original machines came with only 64K of memory standard, and there was little thought of graphics capabilities and specialized ROM BIOS calls. Many early PC applications programs were nothing more than hasty modifications of their CP/M counterparts.

By 1981, CP/M was quite popular on the Apple. If CP/M was such a success, the thinking went, why not MS-DOS? The first MS-DOS cards for the Apple was treated like CP/M: totally text oriented and the disks had to be in Apple format. One of these early MS-DOS cards is still available today: the ALF Products Inc. AD8088 card.

The AD8088 originally consisted of a coprocessor board with an 8088 chip, and a memory board that could contain either 64 or 128K of RAM. The system could read either MSDOS or CP/M-86 (the 16-bit version of CP/M) disks that were in the Apple format. At its peak, the Apple-MS-DOS/CP/M-86 disk catalog reportedly had about 70 different entries. Since Apple-MS-DOS/CP/M-86 never caught on like Apple-CP/M, titles from this catalog are relatively rare today.

Eventually, to combat the disk format and availability problem, ALF offered a disk controller card and disk drive that could read standard MS-DOS disks. This system is probably of more interest to the serious experimenter wishing to hack MS-DOS/CP/M-86 on his Apple than for the serious business user. There are several good reasons for this: 1. Expense. The ALF system with a single disk drive lists for $890, not counting the Apple. A quick look at any of the advertisements for PC clones can tell you why this is not an attractive price. 2. Slot use. A fully configured ALF system would use as many as 3 slots on the

**continued on page 234**


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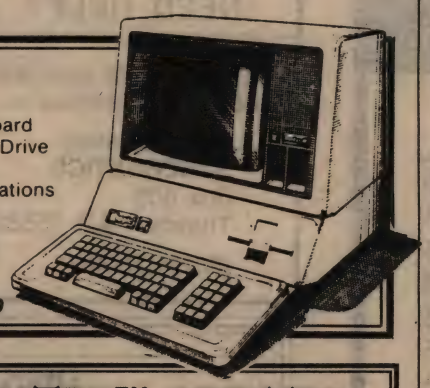

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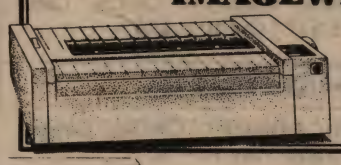

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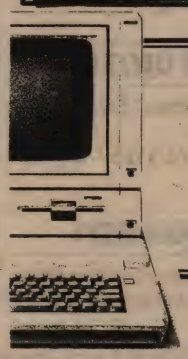

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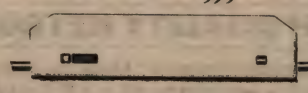

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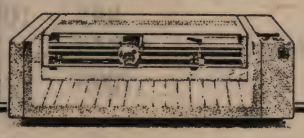

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### Ask The Guru
continued from page 226

purchase signs and displays.

Also obvious are multi-color presentation charts and graphs.

For those places where you absolutely must have a solid black, just use black Omnicrom on top of black toner. This gives you excellent blacks for such camera-ready needs such as advertising copy.

The Omnicrom process also gives you an "instant negative" of your image as well. These are useful for such things as overhead projection sheets, dialplates, and printed circuit negatives. But some fine detail may sometimes end up missing in the negative.

Sometimes, a slight excess amount of ink will be transferred but not fused. This may happen inside the "e" of very small text, or between halftone dots. To fix this, just get some 3M Post-It Cover Tape from your local office supply. Very lightly apply the tape and then gently peel it off. Presto, a perfect image.

Yes, you can even do pastel colors by using halftone screens if you are extra careful.

You can also use this tape to process several different colors onto your copy at once. One fusion pass can give you a few to dozens of colors.

There are sixty colors in all. Around thirty of these are usually in stock, while more stock items are being added. Sheets are available in boxes of 100 of one color. Rainbow packs of 100 assorted sheets of normal or metallic colors are also available.

Besides plain colors and metallics, there are also golds, silvers, and nice pearl.

There's even a clear material. This will convert dull but acceptably black toner into a high gloss, and obviously "printed" black. It will also add a high gloss finish to the regular colors.

I've found the gold a tad garish for business cards. I instead use the more sedate and cheaper Rich Pale Bronze. But the gold certainly is snappy.

Actually, the Laserwriter is not quite ideal for fusing Omnicrom. Before reaching the fusion rollers, there's some electrostatic charging and some edge feeding done along a long and not-quite-straight paper path. So, a wrinkle or two can show up on the first pass. If you get a wrinkle, you just tape a small new strip of Omnicrom material over it, and shove it back through one more time.

You will want to tape the Omnicrom material to your copy at the top, being careful to keep the leftmost 3/8 inch free so the separation belt and drive roller do not wrinkle the sheets. At present, you can expect about a 50 percent success rate on the first pass, and a 90 percent success on two passes.

If you are using full sheets of Omnicrom, be sure to trim them so they will clear the mylar separation belt and rollers.

I suspect that some sort of carrier could be added to optimize Omnicrom for the Laserwriter. Something like 9½"x11" mylar sheet folded ½ inch on either edge and sprayed with anti-static gunk or metallization might work.

Mostly, I think it is just a matter of getting to know the material and working closely with it. Let me know your experiences on this.

Tellyawhat. For this month's contest, just tell me about a copier machine that works with Omnicrom, or find any way to improve the reliability and convenience for direct Laserwriter use. A free Incredible Secret Money Machine to the best ten entries. As usual, we'll provide an all expense paid tinaja quest for two (FOB Thatcher, AZ) to the overall winner.

Write or call, and I'll be happy to send you some Omnicrom samples to play with. We also can do custom printing for you with this most exciting and positively mind-blowing new material. ●

## NEED HELP?

Phone or write your **Ask The Guru** questions to:

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### Apple IIGS
continued from page 224

creation of newsletters, cards, storyboards and cinematic cartoons. The user interface makes the full paint and graphics capabilities of the program easily accessible.

Paintworks Plus gives computer users access to all of the 4096 separate colors offered by the hardware and allows custom designing and editing using a broad array of shapes and patterns. Text may be produced on-screen in any color the color palette offers, and up to 128 customized color palettes may be saved for future reference. Other features include: a color search that identifies all areas of an image that use any color or color shade; a mirror option that provides the ability to draw symmetrical shapes; and a lasso that gives users the power to move any image without capturing the background. Graphic images may also be viewed in full screen before printing.

Writer's Choice elite from Personal Choice Software utilizes an easy-to-learn user interface and introduces one of the first color-capable word processing programs, offering both colored text and highlighting in five distinct colors: blue, yellow, red, black or green. The ability to preview portions of up to 16 separate documents on-screen at one time and ability to cross out a word or word block without deleting it makes the program a useful tool for editors and contact writers.

Paintworks Plus will be available with a suggested retail price of $79.95. Writer's Choice elite, will carry a suggested retail price of $99.95. Both products require a single 3.5-inch disk drive and at least 512K RAM. A color monitor is required for use of Paintworks Plus and recommended for use with Writer's Choice elite.

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# Sideways Utility For Apple II From Funk Software

Sideways for Apple II

Funk Software, Inc. has introduced a new version of its printing utility that can fit wide AppleWorks spreadsheets on standard-width continuous-form paper; it rotates text 90 degrees and prints lengthwise down the page. It works directly from AppleWorks spreadsheet files using familiar AppleWorks style menus and Open-Apple commands; online help is available throughout. The software supports most popular dot matrix printers with graphics capabilities. Sideways print utility software for the Apple II is available for $69.95 (suggested US resale) at participating dealers or direct; dealer inquiries invited.

Sideways for Apple II lets a user specify a left and top border as well as a two-line header (which includes the name of the spreadsheet file, the page number and the date) for printouts of Appleworks spreadsheets. A zoom command toggles between cell contents and cell formulas for display and printing; a particularly useful feature for spreadsheet diagnosis.

The Sideways package actually includes three separate programs: one for printing directly from Appleworks spreadsheet files, one for printing ASCII text files under ProDOS, and one for printing ASCII text files under DOS 3.3. The AppleWorks and Pro DOS versions of Sideways can be copied to a hard disk.

Each of the three programs lets a user specify or select from among the following print options: horizontal and vertical form size; six font (type face) sizes, from tiny to extra large; double strike printing; left, top and bottom margin size; and line and character spacing. A starting page option lets a user continue an interrupted printout by skipping over its initial pages without reprinting the entire document. Print Option settings can be saved to disk.

Sideways for Apple II is also easy to use with ASCII text files. It works with just one screen of options and simple cursor-driven control. It can even perform a file search using wild cards.

Sideways works with graphics-capable dot matrix printers from Apple, Epson, C. Itoh, NEC, Okidata, Star Micronics, Texas Instruments and others.

The Sideways user's manual includes instructions for using it with the AppleWorks spreadsheet, data base and word processor as well as with AppleWriter II, VisiCalc, MultiPlan, FlashCalc, Magicalc, WordPerfect, PFS Plan and Report, Mouse Calc and PractiCalc II.

Minimum system requirement is an Apple IIc, IIe or II+ (with at least 48K of RAM for DOS 3.3; 64K for ProDOS), at least one disk drive, a printer interface card and a dot-matrix printer with dot-addressable graphics capability.

For additional information contact Funk Software, Inc., 222 Third Street, Cambridge, MA 02142; (617) 497-6339.

Mention that you read about it in *Computer Shopper*. ●

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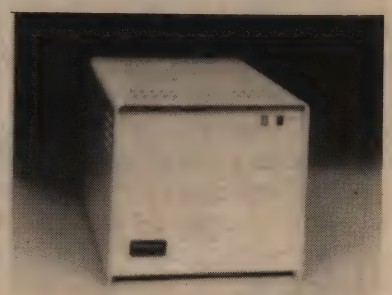

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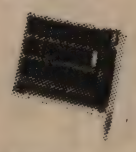

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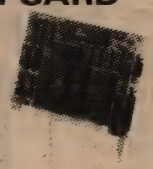

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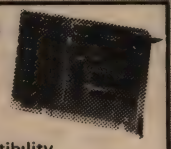

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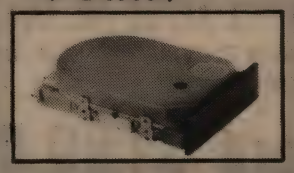

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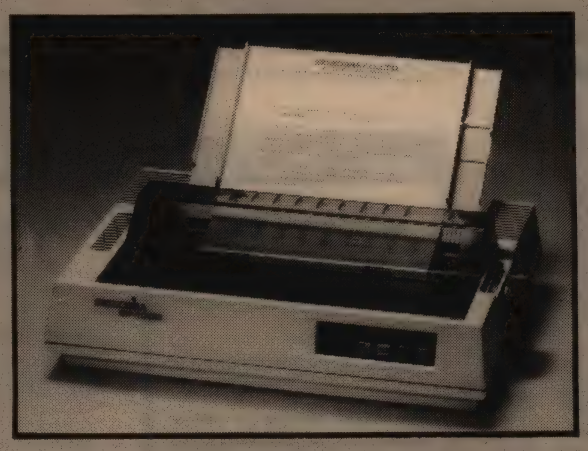

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```
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<=>?@ABCDEFGHIJKLM
789:;<=>?@ABCDEFGHI
/0123456789:;<=>?@ABCDEFGHI
789:;<=>?@ABCDEF
<=>?@ABCDEFGHIJKLM
789:;<=>?@ABCDEFGHI
EFGHIJKL
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The SP-1000 is completely full featured with the latest advances incorporated. It provides excellent near letter quality printing with a dense 24 by 18 dot density. This equates to 41,472 addressable dots per inch and gives superb "typewriter like" printing. Other printers with resolution this high cost hundreds of dollars more.

With the SP-1000 your computer can print 40, 48, 68, 80 or 136 characters per line. It can print 35 separate character styles including 13 double width and 3 reversed styles. You get Pica, Elite, Condensed and Italics – plus true superscripts and subscripts. All this can be done automatically, through easy commands right from your keyboard.

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| Character Font | | | Character Structure (H x V + Space) | Maximum Column Number | Character Spacing (Character/Inch) | Print Speed (Character/Second) |
|---|---|---|---|---|---|---|
| Standard Character | Standard | Pica | *12x9 | 80 | 10 | 100 |
| | | Elite | *12x9 | 96 | 12 | 50 |
| | | Condensed | *14x9 | 137 | 17 | 70 |
| | Near Letter Quality | Pica | *24x18 | 80 | 10 | 20 |
| | | Elite | *12x18 | 96 | 12 | 24 |
| Italic Cursive Character | Standard | Pica | *16x9 | 80 | 10 | 100 |
| | | Elite | *16x9 | 96 | 12 | 50 |
| | | Condensed | *18x9 | 137 | 17 | 70 |
| | Near Letter Quality | Pica | *32x18 | 80 | 10 | 20 |
| | | Elite | *32x18 | 96 | 12 | 24 |
| Graphic | Single Density Graphic | | nx8 | 480 dot column | — | 600 dot column |
| | Double Density Graphic | | nx8 | 960 dot column | — | 490 dot column |
| | Double Speed, Double Density Graphic | | nx8 | *960 dot column | — | 600 dot column |
| | Quadruple Density Graphic | | nx8 | *1920 dot column | — | *980 dot column |
| | 640 Dot Graphic | | nx8 | 640 dot column | — | 326 dot column |
| | 576 Dot Graphic | | nx8 | 576 dot column | — | 294 dot column |
| | 720 Dot Graphic | | nx8 | 720 dot column | — | 367 dot column |

*Indicates that the specified figure includes half dots.

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**Apple IIGS continued from page 228**

View, CA 94043, (415) 960-0410.

### StyleWare Announces Mac-Like Word Processing For Apple IIGS

MultiScribe GS, a word processing program with many of the sophisticated and user-friendly features that popularized programs such as MacWrite and Microsoft Word will bring Macintosh-like pull-down menus, windowing, and fonts to the Apple IIGS computer.

MultiScribe GS is a mouse-based word processing program which lets 512K Apple IIGS users choose from a selection of fonts, character sizes, and styles such as italic, underline, and bold. The main idea behind MultiScribe GS is the same as the guiding principle of Macintosh software: what you see on the screen—fonts, sizes, justification—is exactly the same as what you print.

MultiScribe GS offers a number of different quality print modes to give users draft to near-letter-quality font-based print on a dot-matrix printer, or near-typeset quality with a LaserWriter printer. The latter capability will allow home business Apple II owners to join the desktop publishing revolution without leaving their Apples at home. The package offers multiple windows to edit a number of different documents at one time. MultiScribe GS will allow users to open up to eight different document windows at once.

MultiScribe GS editing options include the Cut, Copy, Paste, and Undo commands employed by Macintosh word processors. Text formatting is provided by on-screen rulers, which offer a variety of formatting choices, including: centering, right, and full justification; zero-, single-, double-, and triple-line spacing; margins; first line indent; and tabs.

MultiScribe GS also includes automatic pagination headers and footers, and Find/Replace. In addition, MultiScribe can be used to customize ASCII text files created by other word processors, such as AppleWorks and AppleWriter.

MultiScribe GS will retail for $99.95 and will be available on 3½" disk from authorized Apple dealers.

For additional information contact StyleWare, Inc., 5250 Gulfton, Suite 2E, Houston, TX 77081; (713) 668-4046.

### TopDraw Combines MacDraw, Apple IIGS Color Features

StyleWare Inc. of Houston, Texas will combine Macintosh-like graphics features and pull-down menus with sophisticated color capabilities in TopDraw, a mouse-based program for the new Apple IIGS computer.

TopDraw is an object-oriented drawing program which will offer 512K Apple IIGS user structured graphics capabilities similar to those offered to Macintosh users by MacDraw, with the addition of color drawing and printing features. The object-oriented graphics capability allows users to create drawings based on shape, or objects, which can be moved, grouped together, separated, reshaped, resized, or filled with patterns and colors. Objects can also be flipped vertically and horizontally, rotated in 90 degree increments, and "locked," or protected from unintentional editing or deletion. Choosing from 4,096 possible colors, users can draw with up to 12 colors at one time.

TopDraw makes use of the enhanced processor speed and expanded memory capability of the Apple IIGS to allow users to create drawings up to several pages in length and width. To help users create drawings in this expanded development environment, TopDraw offers a variety of Macintosh-like graphics "tools," including: rulers; grids; pens; an assortment of filled and hollow geometric shapes—ellipses, rectangles, rounded rectangles, polygons, and arbitrarily-shaped objects; and horizontal, vertical, diagonal lines with or without

**continued on page 233**


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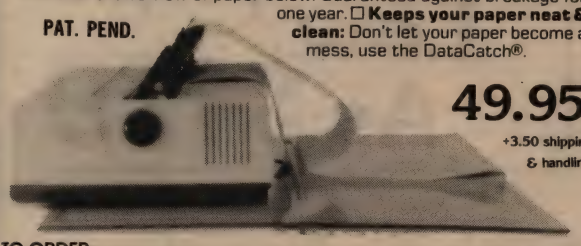

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**Apple II GS continued from page 232**

arrow heads, free-form lines, arcs of ellipses.

In addition, TopDraw allows users to edit colors and fill patterns—including the colors in patterns—as well as pen size and rounded rectangle radius. As in MacDraw, the vertices of polygons can be smoothed, allowing users to give their drawings a more professional appearance. In addition, the horizontal and vertical dimensions of objects can be displayed as they are created, allowing for greater accuracy. Users are also given a choice of fonts, type styles, and sizes for incorporating text into drawings.

TopDraw will offer full LaserWriter printer support, as well as color support on the Imagewriter II printer.

TopDraw will retail for $99.95 and will be available on 3½" disk from authorized Apple dealers.

For additional information contact StyleWare, Inc., 5250 Gulfton, Suite 2E, Houston, TX 77081; (713) 668-4046.

**PageWorks Desktop Publishing Software for the Apple IIGS**

Megahaus Corporation has announced PageWorks, the new desktop publishing program for the Apple IIGS. PageWorks has been designed exclusively for the Apple IIGS and is the ideal program to show off its advances over the present generation of Apple II hardware. PageWorks provides advanced page layout and desktop publishing capabilities, allowing users to produce high quality documents, newsletters, pricelists and other publications. Like Aldus' PageMaker, PageWorks was designed to provide users a means of quickly integrating text and graphics on one page to produce high quality documents on the Apple ImageWriter or LaserWriter.

PageWorks includes some of these Powerful features: Mouse-based (Mac-like) user interface; What You See Is What You Get (WYSIWYG) interactive editing; Reformatting of text incorporated from AppleWorks or other ASCII files by flowing into columnar and other formats; and Text Editing with full flush justification.

PageWorks is a powerful stand-alone software program, that also serves as an enhancement package to Apple Computer's AppleWorks program for the Apple II. PageWorks has the ability to incorporate text from AppleWorks word processing documents. This connection ties PageWorks in nicely with Megahaus' existing AppleWorks enhancement packages: MegaWorks, ReportWorks and ThinkWorks, that are currently available for use on the Apple II.

PageWorks will be able to provide its users with high quality desktop publishing capabilities at the lowest possible price. Like Megahaus's Megaworks, ReportWorks and ThinkWorks, PageWorks will retail at $125. Apple IIGS and PageWorks provide the lowest cost entry into the high performance desktop publishing market.

For additional information contact Megahaus Corp., 5703 Oberlin Drive, San Diego, CA 92121; (619) 450-1230.

**MicroProse Debuts "Silent Service" For The New Apple IIGS**

MicroProse Software, Inc. has announced the forthcoming release of its first title to support the newly introduced Apple IIGS from Apple Computer Inc. The product is an enhanced version of the best-selling MicroProse submarine simulation, Silent Service, which was recently certifed "gold" by the Software Publisher's Association for having surpassed the 100,000 unit mark in overall sales.

Silent Service is the most detailed and realistic submarine simulation available for personal computers. The thrill and danger of captaining a World War II submarine in the South Pacific can be experienced through a wide selection of historical scenarios

**continued on page 236**


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COLOR 700 – Color RGB/ttl .31mm ..... $350

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**Apple-CP/M continued from page 227**

host Apple. 3. Lack of software compatibility. Limitations in ROM, RAM and graphics compatibility, give this system limited capability in handling modern IBM-PC type software.

One of the most ambitious forays into the MS-DOS world for Apples was a unit called the 8086/2 built by a company called Rana Systems. Rana Systems is now out of business, but when they were around they were the producers of a number of highly regarded disk drives and accessories for the Apple II series.

The 8086/2 was probably one of the most complex peripherals ever designed and built for the Apple. It consisted of an 8086 microprocessor, 256K of RAM (expandable to 512K), a socket for an 8087 numerical coprocessor, internal support circuitry as well as circuitry on the Apple interface card and two internal double-sided-double-density disk drives. What it amounted to was an IBM-PC clone that used the Apple as a terminal. In addition, the drives could be configured for DOS 3.3, Pro-DOS, Pascal and CP/M. It had the making of a great unit, so why did it fail?

First and most important was price. The 8086/2 had a list price of $1895. At one time it would have been a bargain, but unfortunately it was introduced at a time of rapidly falling prices of both the real PC and PC clones. The pricing was just not competitive. The second reason was availability. In spite of many visits to many stores, I never actually saw an 8086/2. I did find one salesman who claims he saw one operating at a dealers show. He said I could order one (at full list price and hefty deposit) if I wanted to. The third reason this unit failed was poor advertising. There was never any ads in any of the major magazines for the 8086/2. The most public exposure it ever received was in the "New Products" section of some magazines and by word of mouth.

The story circulated that Rana went under because of the 8086/2. I do not know if that is true. It appears that the 8086/2 was the right product at the wrong time and at the wrong price.

The most recent consideration of putting IBM-PC/MS-DOS capability into an Apple II type machine is an expansion board that has been dubbed "Little Blue." Little Blue is being designed and built by a company called The Engineering Department, Inc. The Engineering Department has excellent credentials for developing a product of this kind, for among their staff they have three of the original six engineers at Apple Computer. They also state that they are doing development work for other clients that include Apple. It seems that if anyone is going to get IBM-PC compatibility on an Apple, these are the guys.

The preview specifications for Little Blue claim that it will have full IBM PC/XT compatibility. It will have a 7.2 MHz 8086 microprocessor with provisions to accommodate a 8087 numerical coprocessor. When fully configured, the card could have up to 640K of user RAM. There will be a CGA (color graphics adaptor) onboard that will support 320x200 color graphics. In addition to all this, they claim that the memory could also be used as a RAM disk by the host Apple.

The Engineering Department is apparently getting around the disk compatibility problem by providing an onboard floppy disk controller that can read the MS-DOS MFM format on additional drives. They also claim that their controller will be able to read the Apple GCR format and that there will be onboard hard disk support. Keyboard compatibility is addressed by allowing Little Blue to be used with an external IBM-PC type keyboard.

As of now, Little Blue is scheduled for release in the first quarter of 1987. The Engineering Department claims 99% compatibility and that only programs that have violated IBM's own guidelines for software development may not work. Little Blue will work with the II+, IIe and (though it did not say in my somewhat dated press release) the IIGS. Marketing and distribution will be handled by a third-party peripheral products company. Initial pricing is estimated to be about $500. If you add to this the cost of a couple of extra floppy disk drives and a keyboard, my guess for getting relatively full IBM-PC compatibility on your Apple would be about $750. This is a fairly competitive price compared to what some clones are going for today. One major advantage to Little Blue, is that with The Engineering Department you would be dealing with an outfit that has an excellent pedigree and excellent credentials. With an unknown clone you may be dealing with a questionable piece of hardware from an outfit that may not be around tomorrow.

### Apologies

In the August issue, I stated that Advanced Logic Systems had software available that would enable their CP/M Card to utilize the Unidisk 3.5. That report was erroneous and I apologize for any problems or inconvenience it may have caused anyone.

### Companies Mentioned

ALF Products Inc., 1315F Nelson St., Denver, CO 80215; (303) 234-0871.

The Engineering Department, Inc., 271 East Hacienda Ave., Campbell, CA 95008; (408) 446-1444. ●


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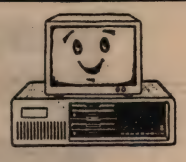

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**Apple IIGS continued from page 233**

ranging from single-ship attacks to multi-patrol missions with heavily escorted convoys. All of a submarine's critical battle stations are replicated: the conning tower, engine room and ship's bridge. Player selection "reality levels" provide challenge and complexity. Automatic time scaling ensures that actions and decisions are constantly required.

The Apple IIGS version of Silent Service further enhances the near reality of this simulation. It was designed to take special advantage of the IIGS' remarkable graphics, sound and speed for exciting play-action. The version features a detailed map system and enemy targets, intricately designed instrumentation and submarine interior, and an expanded enemy fleet. The sound effects of the sea, engine and submarine klaxon are so realistic they have been compared to studio recordings. Game controls have been simplified to employ on-screen icons for all activity selections so that the submarine can be controlled entirely with a mouse.

Silent Service for the IIGS requires 256K minimum memory and one 3.5-inch disk drive. A color monitor and mouse are recommended although the program can be fully keyboard controlled. The program has a suggested retail price of $39.95.

For additional information contact MicroProse, 120 Lakefront Drive, Hunt Valley, MD 21030; (301) 667-1151.

### Managing Your Money For New Apple IIGS

MECA, publisher of the personal financial software package, Managing Your Money, authored by Andrew Tobias, has developed a version of its best-selling program for Apple's new IIGS computer.

Apple's decision to introduce the high-powered Apple IIGS machine coincided with MECA's plans to introduce a more advanced version of its current Apple II product.

MECA's 3.5" disk product for the Apple IIGS incorporates new features designed for the professional and small businessperson—as well as for the home. They include accounts payable and receivable with aging, 5-year budgeting and tax forecasting, loan/mortgage refinancing, buy vs. lease comparisons, planning for a child's education, rental property analysis, retirement planning and much more. These new features will also be available in the soon to be released Managing Your Money Version 2.0 for other Apple II machines.

For additional information contact MECA, 285 Riverside Avenue, Westport, CT 06880; (203) 222-1000.

### Hardware Family of Hard Disk Subsystems Brings High-Capacity Storage to the New Apple IIGS

Powerful, self-contained add-on hard-disk subsystems from ProAPP Inc., including a compact, high-speed subsystem based on a drive with 40M bytes of formatted capacity, give Apple IIGS computer users the capacity and performance needed for storage and rapid access to programs and large-scale data files.

Available as the 10M byte ProAPP 10, the 20M byte ProAPP 20, or the newly announced 40M-byte ProAPP 40S, the new stand-alone subsystems are ideal for storage-intensive graphics, design and desktop publishing applications. They comprise a drive, controller and port circuits, and are contained in compact, attractive packages that sit to the side of the computer.

The ProAPP 20 and the ProAPP 10 are the first hard disk subsystems capable of operation across the entire Apple line. By simply changing cables and reconfiguring a DIP switch, the user can attach either drive to the floppy-disk port of the IIGS or to the Apple-supplied Apple II SCSI Card. These subsystems can also be attached to the SCSI port of the Macintosh Plus or to the floppy disk ports of an Apple IIE, IIC or Macintosh 128K or 512K.

The 40S, which operates at an average access time of less than 30 milleseconds, can be attached to the Apple II SCSI Card available for the IIGS or to the SCSI port of the Macintosh Plus.

The subsystems are preformatted and provide full IIGS PRODOS and subdirectory support. Programs running under this operating system can be booted from the ProAPP hard disk. A printer/spooler interface compatible with the Apple ImageWriter printer is also included with each ProAPP 10 and ProAPP 20 subsystem. Installation of these drives takes a matter of minutes using menu-driven installation software.

The 10M byte ProAPP 10 is priced a $795; the 20M byte ProAPP 20 at $995. The 40M-byte ProAPP 40S is priced at $1995. All subsystems are available now and are backed by a 12-month limited warranty.

For more information contact ProAPP Inc., 10005 Muirlands Suite O, Irvine, CA., 92718; (800) 424-2425.

### Street Electronics Introduces The Echo IIb For The Apple IIGS

Street Electronics, known for their popular speech synthesis and printer interface products, has announced the release of the new Echo IIb for

**continued on page 237**


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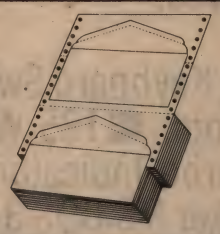

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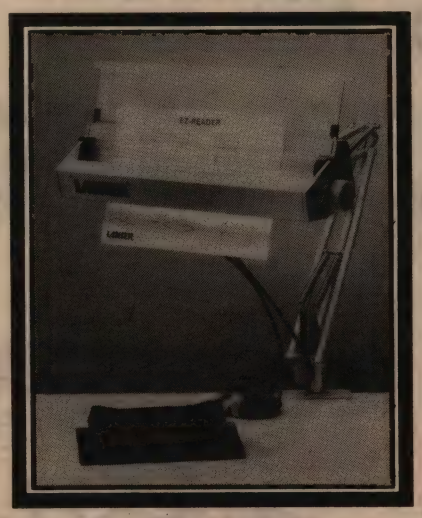

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**Apple IIGS continued from page 236**

the Apple® IIGS™ computer.

The new Echo IIb features both text-to-speech and natural speech capabilities. It is a plug-in board which can be used in the Apple IIGS or Apple IIe, enabling the user to add speech to self-written BASIC programs or to any of the over 100 Echo compatible programs on the market from more than 60 software developers.

The new Echo IIb is improved over previous versions of the Echo because of its larger, higher quality speaker with external volume control and headphone jack. With the addition of headphones, several individuals within a classroom or computer lab can simultaneously access talking programs without distracting their fellow students. The new Echo IIb speaker may also be used instead of the Apple IIGS speaker for improved audio output when using the built-in sound and music capabilities of the Apple IIGS.

The new Echo IIb retails for $129.95. Street Electronics will continue to offer the Echo+ Speech, Music and Sound Synthesizer for the Apple IIe and the Cricket Speech, Music and Sound Synthesizer for the Apple IIc. The Echo+ retails for $149.95 and the Cricket retails for $129.95. Schools and organizations involved in helping the handicapped receive a substantial discount from the manufacturer.

For more information contact: Street Electronics, 1140 Mark Ave., Carpinteria, CA 93013, 805-684-4593.

### Prices Announced For GS RAM Board

Applied Engineering is now shipping two add-on memory boards for the new Apple IIGS.

Prices for the GS-RAM board are $169 for 256K; $219 for 512K; $299 for one megabyte; $379 for 1.5 megabytes.

For unusually high memory requirements, Applied Engineering offers the GS-RAM Plus, using one megabit RAM chips, in one to six megabyte versions on the main board. A piggyback card can be added to increase total memory to 8,192,000 bytes.

Because of the volatility of one megabit chip prices, GS-RAM Plus customers should call the company for current pricing.

The new boards are compatible with all operating systems and software for the new Apple computer, including all versions of Appleworks, BASIC, Pro-Dos, Dos 3.3, Pascal, "C" and CP/M.

For additional information contact Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060.

### AST Research Expands Apple Commitment With Two New Products For Apple IIGS

AST Research Inc. has expanded its commitment to the Apple personal computer market with the introduction of two new hardware products, a graphics video digitizer and a memory-expansion card, for Apple's new AppleIIGS personal computer.

In addition to the two new products, AST announced that the AST-2000, a 3.5-inch hard disk and tape SCSI subsystem, and the one-megabyte Sprint-Disk memory card are now compatible with the new Apple IIGS.

AST's new video digitizer, designated AST-VisionPlus, complements the super high-resolution graphic capabilities of the Apple IIGS by providing color and black-and-white image processing. AST-VisionPlus' unique software includes special-effect features such as zoom-in, aspect ratio control, contrast and color control, gray level compression, inverse video and color assignment to gray levels.

To further enhance the built-in features of Apple's new computer, AST will offer the new RamStakPlus memory-expansion card designed specifically for the Apple IIGS. The one-megabyte memory-expansion card is designed to reside in the computer's special extended memory slot and will take advantage of the Apple IIGS' built-in RAMdisk feature.

For more information contact AST Research, Inc., 2121 Alton Avenue, Irvine, CA 92714, (714) 553-0340.

### Applied Engineering RAM Boards Expand Apple IIGS Memory

Applied Engineering, the first company to offer memory

**continued on page 238**


## SOFTWARE

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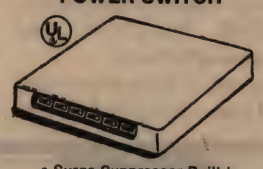

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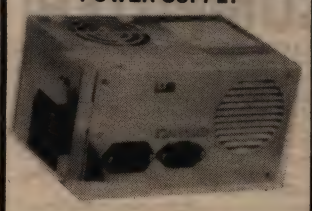

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**Apple IIGS**
**continued from page 237**

expansion over 128K in the Apple IIe has announced two new memory expansion boards for the new Apple IIGS computer.

For normal memory requirements, the GS-RAM provides memory expansion up to 1.5 Megabytea on one card using standard 256K memory chips. An optional piggyback card, expandable to 2 Megabytea is also available for a total of 3.5 Megabytea. GS-RAM is compatible with all IIGS software including AppleWorks, BASIC, ProDOS, DOS 3.3, Pascal, C and CP/M. GS-RAM also acts as a solid state disk drive that eliminates the time currently wasted in accessing drive 1.

For larger memory requirements, the GS-RAM Plus can be expanded up to 6 Megabytes on one card using 1 Megabyte memory chips. With the optional piggyback expander, it is expandable up to 8 Megabytes.

The GS-RAM and GS-RAM Plus are exclusively designed for the Apple IIGS. The boards are available now.

For more information contact Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060.

### Hayes Introduces Smartmodem 1200A For Apple II Computers

Hayes Microcomputer Products, Inc., has announced the Smartmodem 1200A, a new internal 1200 bps modem for use with Apple II computers, including the new Apple IIGS.

The feature-rich modem includes such capabilities as call progress monitoring, rotary and 16 DTMF or PABX dialing commands, built-in text modes, full Hayes Standard "AT" Command Set implementation, CCITT V.22 international compatibility, voice/data transmission, auto dial/auto answer capability, two phone jacks, 1200 bps and 0-300 bps transmission, and convenient redialing.

The Smartmodem 1200A implements the new Hayes custom chip set, developed using the latest LSI technology.

The new Smartmodem 1200A has three DIP configuration switches located at the top of the modem for simple access. The switches can be reached and changed easily when the computer's cover is removed.

This modem operates from an expansion slot within the new Apple IIGS, as well as in the II, IIe, and II+. It is compatible with the Hayes Micromodem IIe and all standalone Hayes modems.

The new Smartmodem 1200A may be operated using a new version of Hayes Smartcom I communications software. The software supports auto dial/auto answer, file management, variable data formats, concurrent file capture, directory display, and provides file transfer capability through Hayes Verification, XMODEM, Stop/Start, and Send Lines protocols.

For more information contact Hayes Microcomputer Products, Inc., 705 Westech Dr., Norcross, GA 30092; (404) 449-8791.

### Apple's Audio Partner: The Bose RoomMate Speaker

Plug a pair of Bose RoomMate loudspeakers into the new Apple IIGS computer and you've entered the next dimension of digital sound. Early in the development of Apple's new computer, with its high quality sound digitizing and synthesis capabilities, the company teamed up with Bose Corporation of Framingham, MA, the international audio products manufacturer. In all product demonstrations during its nationwide debut, the IIGS will perform with Bose's "Special Edition" RoomMates, made to match the new computer.

The room-filling, lifelike sound of the compact RoomMate speakers makes them the ideal complement to the new computer's sophisticated 15-voice synthesizer. Originally introduced to turn pocket stereos and portable Compact Disc players into complete music systems, the Bose RoomMate features two full-range drivers, a dual-channel power amplifier, an active equalization network, and distortion limiting circuitry, all compactly fit in two 6x9x6 inch enclosures.

The RoomMate features many of the technological advances used in Bose Corporation's top-of-the-line 901 loudspeakers, considered by many experts to be the finest ever built. The RoomMate's ease of use, small size and versatility of applications has created a new category for sound equipment. An increasingly popular addition to the Apple Macintosh, the RoomMate can transform nearly any product with a headphone jack into a powerful audio system.

Bose RoomMate speakers are available through computer and audio specialty stores and fine department stores nationwide. The units are priced at $229 per pair.

For more information contact: Bose Corp., 100 Mountain Road, Framingham, MA 01701, (617) 879-7330.

### Orange Micro Announces ProGrappler, RamPak 4GS And JuiceBox For The Apple IIGS Computer

Orange Micro, a leader in microcomputer enhancement products, announced three new products for the Apple IIGS. Orange Micro products include the ProGrappler intelligent parallel printer interface, the RamPak 4GS memory subsystem, and the JuiceBox system maintenance accessory.

The firm announced that its popular Grappler+ parallel printer interface will be discontinued and replaced with the new ProGrappler. Although the new product is designed to be used with the Apple IIe and IIGS, it provides special support for the IIGS user.

The ProGrappler will keep Grappler+ compatibility, but will incorporate several new features. It provides all the hardware necessary to connect most popular printers to the Apple II Plus, IIe or IIGS, and provides many options for printing text or graphics directly from the Apple's screen. This is accomplished on the enhanced IIe and IIGS through new pull-down menus, allowing easy visual selection of any ProGrappler or printer features. These options include inverted and rotated graphics, graphics windowing, enlargement, and printing of any hi-resolution Apple graphic, including the IIGS's new super-hi-resolution screens. All features can also be accessed through the traditional "CTRL-I" commands or now through easier-to-understand "+" commands, where options are expressed with plain English words.

Special for users of the Apple IIGS, ProGrappler functions can be accessed through the Desk Accessory menu in the IIGS operating system. The Desk Accessory menu is accessible through many existing applications, and will be fully

**continued on page 241**


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The RAMJET is available in 16K, 64K, and 256K configurations. Memory size is user upgradable, just by changing chips. An optional expansion board allows a full 512K of buffer memory.

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The RAMJET is available with either a Parallel to Parallel connection, a Serial to Serial connection, or with one Parallel and one Serial connection. The Parallel/Serial version can be set for either parallel to serial or serial to parallel operation. The serial ports can be independently set up to 19,200 baud, with either XON/XOFF or DTR handshaking.

FEATURES

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EASY TO USE

Each serial port has special indicator lights to show data and control status. This feature is worth its weight in gold for ease of hook up. All parallel and serial connections have been designed for easy direct hook up to your computer and printer.

COMPLETE

The RAMJET comes in an attractive solid aluminum enclosure. Included is a UL/CSA approved wall-plug power supply and complete instructions on hook up and use.

Call (206) 624-4985

For information and ordering. Suggested list prices are:

RAMJET 16K - $169.00 RAMJET 256K - $269.00
RAMJET 64K - $199.00 RAMJET 512K - $399.00

Be sure to specify whether you want Parallel/Parallel, Serial/Serial, or Parallel/Serial. The expansion card from 256K to 512K is available separately for $129.00. Call today! Visa, MC, and COD welcome. Corporate accounts welcome. Dealers very welcome. Call now!

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# Softstrip For Key-Less Input

Figure 2

by Philip Chien

Does anybody like to type in computer programs from listings? This problem has plagued users, and editors of computer magazines ever since the first computers became available. Computer programs in magazines are very popular. An unusual technique can be shown, a demonstration program can be provided, and some rather sophisticated utilities have all been published in various magazines. The diskette with the published programs can be provided to users for extra cost, but users have to wait several weeks before ordered diskettes can be received. The magazine publisher can decide to provide a diskette with the magazine, although this does raise the price of the magazine, and many diskettes get damaged in shipment to the newsstand or subscriber. If the magazine publishes programs for different computers, or even different disk formats then the problem multiplies. The obvious solution is to publish the program listings in the magazine with the article. For simple, fairly short programs this is feasible, but if the program involves graphics, or any decent size datafile it becomes impractical.

Various solutions have been suggested and tried. Some magazines have a BBS where programs can be downloaded, but most users will require a long distance phone call to access the BBS, and many users don't have modems. Some time ago a magazine published schematic diagrams and directions showing how to build a light pen/bar code reader, and published barcode listings of some programs along with the articles. The trouble was that different people would drag the reader at different speeds, and the software just wasn't good enough to read programs reliably.

Cauzin Systems has released their Softstrip reader, a rather sophisticated bar code reader which is basically a souped up version of the common light pen. The reader sits on top of the barcode page, and is positioned with an alignment dot and bar. A carriage moves the reader mechanism along a track while it reads in the data. The combination of a mechanically controlled reader and extra checksum information makes the reader very reliable, and efficient. According to Cauzin the reader should be good for at least 25,000 reads. A set of eight lenses are used to read in the data, and 160 lenses are used to keep the speed of the reader accurate. A strip can be out of alignment by as much as 6% and still be readable. The standard data loss rate specified is 1 bit in 1000 where a second read is required, but each bit is read four times, making errors rather rare. The strip uses a near infrared reader, and is insensitive to most stains and paper creases. As long as a stain is transparent to infrared light, the reader will ignore it.

Reading a Softstrip is relatively simple. Place the reader on top of the alignment dots on the strip, and set up the utility program and a blank diskette. The reader will read in data at approximately 2K per minute, and a countdown timer on the screen keeps you informed as to the status. It's not as fast as a disk drive, but it is much faster than cassette recorders (remember those?) A Softstrip can hold up to 5.5K of data per strip, depending on the quality of the paper and the reproduction method, and if a file is larger than a Softstrip you will be requested to move the reader to a continuing strip. If any errors are encountered in the read, the utility program will prompt you to re-position the reader on the strip, and attempt to read again. The only problem I had with reading was with the paper or reader slipping out of place. As long as the reader was on a flat surface everything worked fine.

Cauzin presently supports the Softstrip format for the Apple II series, Macintosh, and IBM PC compatibles. The Softstrip reader comes with the proper cables and utility programs to attach it to your computer. On the Apple II, and IIe series the Softstrip reader attaches to the computer's cassette port. On the Macintosh, IIgs, IBMs, and other computers it attaches to your serial port. Separate connecting cables are available for the Macintosh, Mac Plus-IIgs, IIc, and RS-232 connectors. Software support varies from machine to machine. On the Apple II series DOS 3.3 and ProDOS are supported. Finder and HFS are supported on the Macintosh, and MS-DOS is supported on IBM compatible machines. On other machines it is possible to read generic (text only) Softstrips into a terminal program via a standard RS-232 port.

Cauzin prints several Softstrips each month in its ads. Various magazines, use the Softstrip format for programs, indexes, and information files. In many cases a magazine will publish a program and a Softstrip side-by-side. I am quite proud to say that my program "Shuttle Tracker" was the first Apple program to be published in Softstrip format simultaneously with the article. Besides its ads, Cauzin Systems is publishing a variety of programs and utilities in the

continued on page 242


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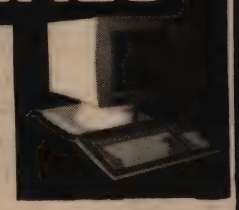

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**Apple IIGS continued from page 238**

enabled on most software written for the IIGS. In this way, the user can print virtually anything displayed on the screen, providing a "screenshot" without resetting the Apple or restarting software. On earlier Apples this was only possible through the use of external switches.

The ProGrappler is compatible with most popular printers, including Epson, Okidata, Toshiba, ProWriter, Panasonic, Citizen, Star Micronics and many more. It will be available at a suggested retail price of $129.

Orange Micro's advanced entry into the memory expansion market is called the RamPak 4GS memory subsystem for the Apple IIGS. It provides a standard 512K of memory, expandable by the user to 4 megabytes, and includes a powerful memory management utilities package for RAM caching, diagnostics and, for the first time, dynamic allocation of memory.

The RamPak 4GS uses 256K x 4 RAM chips, enabling the user to expand in 2 chip (or 256K) increments, as opposed to the 8 chip minimum required by other formats. Memory automatically self-configures, so no switch settings or jumpers need be changed. And the RAM diagnostics utility will detect and pinpoint any RAM problems that may arise, before they cause data loss or damage.

The RamPak 4GS provides powerful memory management to maximize system efficiency and significantly increase performance. RAM caching stores often-used programs or routines in main memory, eliminating the usual waiting time for disk access and loading. Statistics may be recorded on the cache's efficiency, enabling the user to review and optimize the cache. The RamPak utilities also recognize Apple's RAM disk provided with the IIGS system, and work perfectly with it.

To optimize simultaneous use of several system caches, the RamPak 4GS also provides Dynamic Cache Allocation. This unique feature actually manages your RAM caches, assigning the appropriate amount of RAM to each for the task in progress. The RamPak 4GS's Memory Management Utilities will access both the RamPak's memory and that resident on the IIGS motherboard.

The RamPak 4GS is designed specifically for use with the Apple IIGS. It will be available at a suggested retail price of $259 for 512K RAM.

### The JuiceBox

Orange Micro's third introduction is an Apple IIGS maintenance system called the JuiceBox. The JuiceBox provides protection against power fluctuations, heat and dust, and comes with a guide to proper system care over time. Surge suppressed power is provided for the Apple IIGS and two peripherals, controlled by a single lighted switch on the JuiceBox's front panel. A fourth power outlet is unswitched, for a desk lamp or other non-system application. A circuit breaker prevents serious system overloads. A system fan is also included, providing cooling filtered air to the Apple IIGS system. This filter is easily removed and cleaned by the user, to prevent clogging or system contamination.

Molded to fit snugly against the Apple IIGS, it is designed in the same color and style as the computer. The JuiceBox will be available at a suggested retail price of $119.

For further information contact Orange Micro Inc., 1400 North Lakeview Avenue, Anaheim, CA 92807; (714) 779-2772.

### DataDesk International's Turbo-ADB Enhanced Keyboard

DataDesk International has debuted the Turbo-ADB, the first enhanced keyboard ever available for Apple computers. Based on Apple's new Apple DeskTop Bus (ADB) specifications, the Turbo-ADB Enhanced Keyboard brings to the Apple IIGS, the features and flexibility one would expect from a professional full-size keyboard.

The Turbo-ADB keyboard has a built-in port for connecting other input devices such as a Mouse, Joysticks, Graphics Tablets, and etc. These devices are daisy-chained on the input bus (ADB) of the Apple IIGS and the need for additional cards and or hardware interfaces in the CPU is eliminated.

The Turbo-ADB Enhanced Keyboard offers several other "firsts" for Apple that will help make the Apple IIGS a serious contender in the business and educational marketplace. Foremost are the Turbo-ADB's 15 separate Function Keys with four levels of commands available to provide the ultimate flexibility in keyboard control.

The Turbo-ADB's 60 function keys incorporate Apple's new standard Apple Desktop Bus (ADB) function keycodes. The first level of function keys are the default ADP function keycodes, while the second, third and fourth levels are ADB function keycodes plus Shift, Ctrl and Shift + Ctrl preample modifiers, respectively. The Shift, Control and Function Key combinations are commands utilized by most ADB software, and are available instantly on the Turbo ADB Keyboard as one-key commands. Indicator lights quickly reference which function level you're working in.

For more information contact DataDesk International, 7650 Haskell Ave., Ste. A, Van Nuys, CA 91406. (818) 780-1673.

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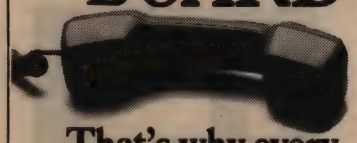

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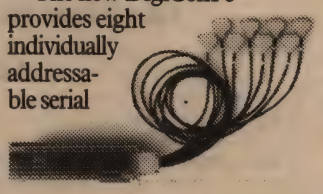

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**Softstrip continued from page 240**

Softstrip format. When you purchase a Softstrip reader you get a one year membership to the Stripware club which publishes programs (in Softstrip format of course) monthly.

Besides magazine printouts, there are quite a few other applications for Softstrip. For long term storage a Softstrip is much better than floppy diskettes since it is insensitive to folding or magnetic fields. In comparison with paper methods it takes up much less space, and can be converted back into computer format much easier. A more unusual storage application involves storing patient medical information in Softstrip format on a patient's ID card, and in the permanent record. For immediate distribution, applications updates like catalogs and indexes can be easily updated and sent out to users. Instead of searching through dozens of magazines for a particular article, all you have to do is use a Softstrip reader to read in the index into your word processor, and use a search function for the title of the article. In most cases where data has to be distributed to many people, Softstrip makes sense. If a company is sending out a catalog update or new phone list to its affiliates, a Softstrip can be made up, photocopied, and distributed by mail much easier, and less expensive than mailing a new catalog or phone book. Since a Softstrip is just a piece of paper, it doesn't require the protection a floppy diskette requires, and is much easier to reproduce with a photocopier. Distribution of Softstrip photocopies can be controlled to a degree. If a Softstrip is stamped Do Not Reproduce in red ink then it is still readable by the Softstrip reader, but a photocopy of the strip is unreadable. Of course there is nothing to stop anybody from reading in the original Softstrip and then making copies of the diskette with the data, but making a Softstrip un-photocopyable eliminates the possibility that an unauthorized person will make extra copies of a Softstrip before it reaches its destination.

Besides storage and ease of distribution, the Softstrip format can also be used to transfer data between different computer formats. A generic text file Softstrip can be created which can be read by any Softstrip compatible computer. It's quite easy to make a text file on an Apple, and read it into a Macintosh or IBM.

Using pre-made Softstrips limits your database to what is published, but you can also make your own Softstrips. An optional Stripper program (distributed in Softstrip format of course) will work with dot matrix printers. The Apple II version of the Stripper will work with an Imagewriter or Epson printer. On the Macintosh two versions are supported, a standard dot matrix version, and a Laserwriter version. Retail price for the dot matrix version is $19.95, and the Laserwriter version retails for $99.95. Cauzin Systems licenses the Stripper program for non-commercial distribution of Softstrips, but commercial licenses are available. Dot matrix outputs are fine for low density strips, and Laserwriters are suitable for medium density strips, but there are cases where you will need high density strips suitable for reproduction in magazines and books. Cauzin will provide negatives suitable for mass printing for a nominal cost. At the present the company is quoting a one week turnaround time, and approximately $50 per strip.

There are some disadvantages with the Softstrip reader though. In comparison with diskettes the density is fairly low, limiting Softstrip applications to relatively small programs and data files. The hardware is mechanical, and involves moving parts so it is subject to breakdowns and missalignments. Most importantly the Softstrip format and reader all come from a single source—Causin Systems. If Cauzin in the future decides not to support a particular computer, or raises the prices, then it is not possible to change companies, or develop your own new hardware. For example, on the Apple II series Cauzin supports DOS 3.3 and ProDOS, but not Pascal or CP/M. Cauzin decided that it would be a better use of resources to support the more popular operating systems. Granted it is possible to save a Pascal or CP/M file as a text file, read it into a Softstrip reader, and then convert it into the proper operating system, but that is more complicated. At the present Cauzin supports ProDOS 8 and DOS 3.3 on the Apple IIgs, but no decision has been made as to whether or not ProDOS 16 will be supported.

On the good side Cauzin does have a set of technical notes which are available upon request. No, the company does not go out of its way to tell you that they are available, you have to ask for them. The technical notes consist of 31 pages of documentation on how the reader works, pin outs for the interface cable, and how to access the reader directly. In addition the notes include information on how strips are made, and how the data is encoded. Hopefully some second party software developer will come out with support for other operating systems and computers.

Product: Softstrip
Retail Price: $199
Distributor: Cauzin Systems
835 S. Main St.
Waterbury, CT 06706
1-800/533-7323
1-203/573-0150 CT
Available formats: Apple II series, Macintosh, IBM PC
Warranty: 1 year
Supports: Apple: DOS & ProDOS utility program, Macintosh Finder and HFS utility, IBM PC MS-DOS utility. Stripper program (dot matrix: $19.95, Mac Laserwriter: $99.95)

Figure 3. Softstrip for Binary Clock.

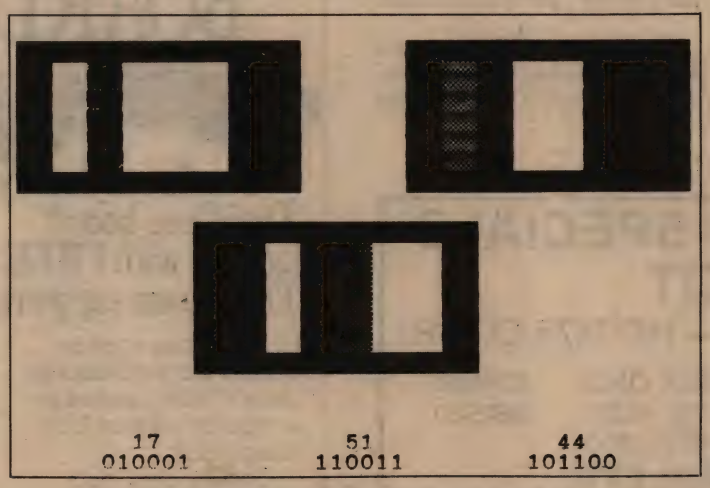


Figure 2. Binary Clock: Can you tell what time it is?

### Binary Clock

Do you know what time it is? Does your Apple? Ever since Apple decided to support automatic timestamping with ProDOS clocks have become very popular accessories for the Apple. Most clocks come with simple demonstration programs which show how to tell the time, but are rather boring. Typical clock demonstrations include the time in the middle of the screen, a digital clock, or even a grandfather clock. But isn't the time SUN AUG 24 86 4:46:17 AM or even 08/24 4:46:17.086 rather boring? Wouldn't a time like 00100 101110 01001 be more interesting? For those of us who know how to really use computers, and learned how to count using only two fingers the answer is a definte YES! Binary time is so much more interesting, and it impresses the boss when you can tell the

**continued on page 245**

Figure 1

```
 0  REM
----------------------
Binary clock

(c) 1986 by Philip Chien
----------------------

 100  REM   SETUP AND START PROGRAM
 110  DIM A(2),C(2,1)
 120  D$ =  CHR$ (13) +  CHR$ (4)
 130  DATA 3,5,25,5,13,23
 140  REM  screen locations for display
 150  FOR T = 0 TO 2: FOR S = 0 TO 1:
        READ C(T,S): NEXT S,T
 160  REM  SEARCH FOR CLOCK
 170  FOR CS = 7 TO 1 STEP  - 1
 180  IF  PEEK (49152 + CS * 256 + 5) =
        255 AND  PEEK (49152 + CS * 256
        + 7) = 5 THEN 240
 190  REM   $Cn05 = $FF  $Cn07 = $05
 200  NEXT CS
 210  TEXT : HOME : VTAB 11
 220  PRINT "ERROR! There is no clock in
        your system."
 230  END
 240  REM CLEAR SCREEN, SET GRAPHICS,
        CLEAR FLAGS
 250  HOME : GR :C = 1:LM =  -1:LH =  -1
 260  REM  CLEAR SCREEN IN BACKGROUND
        COLOR
 270  COLOR= 14: FOR R = 0 TO 39: VLIN
        0,39 AT R: NEXT
 280  REM PLOT WHITE BACKGROUND BOXES
 290  COLOR= 15
 300  FOR Y = 0 TO 14: FOR S = 0 TO 2:
        HLIN C(S,0) - 2,C(S,0) + 13 AT
        C(S,1) - 2 + Y
 310  NEXT S,Y
 320  REM WELL START THE PROGRAM
        ALREADY!
 330  REM  MAIN LOOP
 340  REM READ TIME FROM CLOCK
 350  PRINT D$"PR#"CS: PRINT D$"IN#"CS
 360  INPUT "#";MO,DW,DT,A(0),A(1),A(2)
 370  PRINT D$"PR#0": PRINT D$"IN#0"
 380  K = 0
 390  REM HAS THE HOUR CHANGED?
 400  IF A(0) = LH THEN K = 1
 410  REM HAS THE MINUTE CHANGED?
 420  IF A(1) = LM THEN K = 2
 430  LH = A(0):LM = A(1)
 440  FOR R = K TO 2
 450  T = A(R)
 460  REM CHEATERS LINE TO PRINT DECIMAL
        LINE
 470  VTAB 21: POKE 36,R * 14 + 5:
        PRINT T;" "
 480  REM SPLIT EACH DIGIT INTO SEPERATE
        BITS
 490  FOR S = 5 TO 0 STEP  - 1
 500  COLOR= 0:A = 0
 510  IF T >  = 2 ^ S THEN T = T - 2 ^
        S:A = 1: COLOR= C:C = C + 1:
        IF C > 14 THEN C = 1
 520  REM PLOT COLOR BARS AND PRINT TIME
        ON SCREEN
 530  X = C(R,0) + 10 - S * 2
 540  Y = C(R,1)
 550  VLIN Y,Y + 10 AT X:
        VLIN Y,Y + 10 AT X + 1
 560  VTAB 22: POKE 36,R * 14 + 8 - S:
        PRINT A;
 570  NEXT S,R
 580  REM CHECK IF ESCAPE IS PRESSED
 590  IF  PEEK ( - 16384) <  > 155 THEN
        350
 600  POKE  - 16368,0
 610  REM QUIT TO MENU ROUTINE
 620  VTAB 24: PRINT : PRINT "That's all
        folks!"
 630  END

32000  REM Binary Clock
32010  REM LAST MOD  AUG  4  6:46 PM
```

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# Apple Donates Computers To Project in Kenya

Apple Computer, Inc. has awarded computer systems valued at $120,000 to the Aga Khan Foundation's Computers in Education project in Kenya, one of the earliest uses of educational computing in the Third World. The donation marks the first major contribution to the Foundation by a corporation in the United States, as well as the first educational grant by Apple U.S.A. to a project in a foreign country.

Under the Apple-Aga Khan Foundation partnership, Apple has donated 34 computer systems to be used in six schools—two private and four government-aided secondary schools. The project—initiated in 1982 at the Aga Khan Academy in Nairobi, Kenya, and managed by Aga Khan Education Services—focuses on using computers as learning and teaching aids within traditional subjects. The Foundation is committing $290,000 in the first year of the three-year project.

Through P.A.C.T. (Private Agencies Collaborating Together), donated Apple computers are being used in Asia, Africa, and Latin America in a variety of economic and resource development projects.

Apple's presence in Kenya is overseen by Gilles Mouchonnet, general manager for the Mediterranean, Middle East, and Africa. He describes the Aga Khan grant as "a way to spread Apple's giving programs to areas that are often just learning about our technology. That makes it very exciting for us to participate."

Local help for the Computers in Education project is being provided by Comprite, in Nairobi. The dealership, according to general manager Salim Talib, will assist with equipment set-up and training.

The Apple equipment will be formally presented at a ceremony in Nairobi on October 7. In attendance will be Hon. Peter Oloo Aringo, E.G.H., M.P., the Kenyan Minister of Education; Sir Eboo Pirbhai, chairman of Aga Khan Foundation (Kenya); and J.G. Kiereini, chairman of Comprite Africa, who will represent Apple Computer.

Apple's donation consists of 33 Apple IIe systems, one Macintosh system (for development purposes), ImageWriter printers, software (in English and French), and peripherals.

For more information contact Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010.

Mention that you read about it in *Computer Shopper*. ●

# Two New Guides To The Apple IIGS Computer

Bantam Books will publish two new reference guides for the Apple IIGS computer; *The Apple IIGS Book* by Jeanne DuPrau and Molly Tyson, and *The Apple IIGS Toolbox Revealed* by Danny Goodman. They will be published as trade paperbacks.

Written by Apple insiders, *The Apple IIGS Book* covers all aspects of the Apple IIGS computer, from conception and development to its unique features and capabilities. Beginning with a detailed user's reference guide, the book explains the innovative features of the IIGS, basic computer concepts and operational procedures, the IIGS's 16-bit environment and the new sophisticated software programs. The book provides a detailed description of the mouse users interface, the Finder, and the improved screen resolution and sound definition. It covers the three different operating systems which allow users to utilize the Apple IIGS to its full capacity. Interviews with members of the development team and Steve Wozniak that reveal intimate details of the computer's development and design are also included.

*The Apple IIGS Toolbox Revealed* defines the nearly 600 assembly language subroutines available to the Apple IIGS user. It explains how to utilize the onscreen windows, color animation, and detailed graphics with the help of the toolbox. For programming newcomers, a description of programming languages and suggestions on how to choose the best one for the job at hand is included. For more experienced users, instructions are given on how to incorporate the toolbox routines into C Pascal and assembly language programs, how to design event-driven programs around Apple's User Interface Guidelines and the comparisons between the Macintosh and the Apple IIGS toolbox. The user is provided with instructions on how to adapt Macintosh programs to the IIGS's 4,096 colors.

Jeanne DuPrau and Molly Tyson are senior writers in Apple's User Education department and have written for national publications.

Danny Goodman is the author of nine books on computers and a Contributing Editor to *Macworld*.

For more information contact Bantam Books, 666 Fifth Avenue, New York, NY 10103; (212) 765-6500.

Mention that you read about it in *Computer Shopper*. ●

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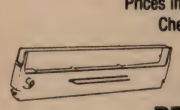

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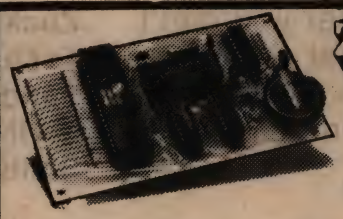

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**MacUniverse continued from page 112**

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*Font/DA Mover$x Magic: I recently learned that depressing the option key when using the Font/DA Mover* can cause all sorts of interesting things. For example, if the option key is depressed when you start the program, you will default to the desk accessories rather than to fonts. Holding down the option key when clicking on the open button will display all the files on the disk. This lets you move fonts and DAs in and out of any file that has resource forks. Holding down the option key when clicking on the Close button will eject the disk that the file is on. Finally while clicking QUIT the option key causes all disks but the startup disk to be ejected.

**Avoiding disk fragmentation:** If you have a full hard disk and constantly add and delete files, sooner or later you will notice that your Macintosh has substantially slowed down. This is caused by disk fragmentation. This arises because parts of files are scattered all over the disk and the read/write head must jump all over the media to read the file. The cure for this is simple. Copy all the files off the disk/volume, reinitialize the disk, and then copy the files back on.

**Single-sided vs. double-sided media:** I recently received a query on CompuServe whether a single-sided diskette can be used as a double-sided. The answer is yes and no. If you listen to the disk manufacturers, they will say no. My experience, on the other hand, has been completely different. I have successfully used single-sided diskettes as double-sided for years without a bit of trouble. Of course if I manufactured double-sided disks, I would probably not tell you this.

**Color disks:** If you only use floppy diskettes and have a lot of different applications, one way to keep your disks straight is to color code them. For example, use red only for word processing, blue for accounting, and so forth. If this sounds great to you, then you can become a true color disk junkie with a new line of diskettes manufactured by C. Itoh. Called Rainbox Color Diskettes, each box has 10 different colors. They are pink, blue, bright red, orange, yellow, green, brown, blue, grey, and dull red. A box of 10 single-sided costs $45 while a box of 10 double-sided will cost you $55.

**CompuServe Material:** This month I have two fun programs to pass on, *Safari* and *TaskMaster*.

*Safari*: This is a simple arcade game for children of all ages. The scenario is simple. All the animals in the forest are racing across the screen in order to get in line to buy tickets to the next Bruce Springsteen concert. You, being the game warden, cannot allow the animals to do this. So with your trusty mouse, you tranquilize them. You can continue to tranquilize animals until five have made it across.

Not only is the game cute, but if you have children it will help them improve their hand-eye coordination. The game is located in DL4 under the name SAFARI.BIN.

*TaskMaster*: This is the most remarkable multitasking pro-

**continued on page 265**

**Softstrip continued from page 242**

time, and all he/she sees is a bunch of color bars.

To enter Binary Clock into your computer you have three choices. You can type in program listing (Figure 1), you can read in the file with the Softstrip reader (Figure 2—see accompanying article for information on Softstrip), or if you have a modem, you can download the program from my BBS, Earth News Central at 718/934-0774. Logon as a new user, and read General file number 8. Capture the file to your buffer, save it as a text file, and EXEC it into Applesoft.

The program is relatively simple, and straightforward. It has been tested on a Practical Perpherials ProClock, and an Applied Engineering Timemaster H.O., but it should work with most other Apple compatible clocks without any modifications. Certain special clocks, the IIc Clock in particular, will require modifications to the program.

Lines 100 to 310 setup the program, and clear the screen. Lines 160 to 230 search your slots to determine which slot your clock is installed in. If there is no clock then the program stops, otherwise the screen is cleared, and the main program loop starts.

The main loop reads in the time, and determines whether or not the minutes or hours have changed. Each time digit (hour, minute, second) is split into binary bits in lines 490 to 570, and plotted as LORES bars on the screen. The time is also printed on the bottom of the screen in binary and decimal formats. If ESCAPE has been pressed then the program will end, otherwise it will continue. Line 470 is a "wimps line" for those who need decimal information to tell the time, and should be removed by any true programmer. POKE 36 is a more efficient way of doing an Applesoft TAB, LH and LM save the last minute and hour, A(0) is the hour, A(1) is the minute, and A(2) is the second. Lines 160 to 230 will have to be changed if your clock card does not look like a standard ProDOS compatible clock, and the clock read in lines 340 to 370 may have to be modified also.

Is the program worth the extra effort, or is it just one more egotistical way for programmers to show that they are better than the rest of the world? Well, of the three friends who tested the program for me, two of them removed the decimal print line and use the program constantly as a binary clock, and the other one erased the disk, and gave it back to me. Which doesn't say much about the program, but I guesss it says something about the people I call friends. ●


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**MacLightning continued from page 127**

less than 30 seconds. In the interactive mode the program kept up with me at 65 words per minute (the fastest I can type).

**The Dictionary:** I am amazed at the completeness of this dictionary. It has 80,000 of the most commonly used words and best of all, they are all spelled correctly. In the course of two weeks of daily use, I have not found one misspelled word. Target Software is so sure there is not a misspelled word that they offer a money back guarantee if you can find one.

Another added bonus with the dictionary is the ease at which the user can add and delete words. Unlike most of its competition, if you add a misspelled word to the MacLightning dictionary, it is easily deleted.

**Grammar Checking:** MacLightning has some minimal grammar checking capabilities. It will beep if it detects any of the four following conditions: (1) forgetting to capitalize the first word of a sentence; (2) typing the same word twice (e.g. "for for"); (3) placing an apostrophe incorrectly in a contraction; or (4) typing a capital letter in the middle of a word.

**Manual:** The manual is 86 pages and does an excellent job of explaining the program. The program is so simple to use that most experienced Macintosh users will be up and running with it in less than 10 minutes.

**Compatibility:** Target claims MacLightning is 90% compatible with all Macintosh software and I believe it. So far, I have gotten it to work with MacWrite, Microsoft Word, PageMaker, Ready Set Go, Jazz, Helix, File, and Excel. It does not work with MacDraft, MacDraw, and ThinkTank (all versions).

MacLightning is very compatible with Switcher. So long as 256K is assigned to the application and it is only loaded into one, it will work.

**Additional Modules:** In order to expand the functionality of MacLightning, Target has plans to market additional modules that merge with it. Already three modules have been released. They are a legal dictionary, a medical dictionary, and a thesaurus.

**The Legal Dictionary:** The legal dictionary is Merriam Webster's Legal Dictionary. This version contains 35,000 different words (my hardback edition only contains 28,000) and is rather complete. As a test I went to Black Law Dictionary (the "official" legal dictionary) and chose six words at random. They were consuetudinary, fatigability, feticidal, legislatress, quadrumvir, and testamentum. Each one was in the MacLightning module. The only deficiency I found was that the standardized legal abbreviations, such as F.Supp., F.2d, N.W.2d, and U.S. were not included. Notwithstanding this deficiency, at $99.95 the module is an absolute necessary for any one who does extensive legal writing, whether he or she be a student, judge, or lawyer.

**The Medical Dictionary:** The medical module contains 28,000 words from Webster's Medical Dictionary. I cannot judge its adequacy because I am not a doctor. However assuming it is the same high quality as the legal module, I cannot see how anyone who does extensive medical writing will not find this module extremely useful.

**The Thesaurus:** The thesaurus module is simply outstanding. To begin with, it contains Merriam Webster's 45,000 word Thesaurus with over 1.4 million possible combinations of synonyms. Additionally complete definitions are provided for each word.

The thesaurus is activated by double clicking on a word and selecting the thesaurus from the MacLightning menu or pressing <COMMAND> <8>. If the word is in the thesaurus, a window appears containing the word, the number of different uses for the word, its definition and a list of synonyms. For example, for the word "complete" it shows eight different uses along with an average of six possible synonyms.

At $49.95 this thesaurus is a steal for the writer who needs the raw power delivered by this module.

**Limitations, Bugs and Such:** A major limitation with the program occurs when non-interactively checking a large document. Since the MacLightning uses the "search and replace" capabilities of the host program, its speed is limited by the size of the document. So long as the document is short (under 20 pages) this presents no problem, but searching for a misspelled word in a 200 page document can mean a long wait.

While I was unable to crash MacLightning, I did find two minor bugs. First it occasionally says portions of words are misspelled. For example, it occasionally selected the "ity" out of "parity," the "th" out of "the" and the "rd" out of "board" as misspelled. According to the developer this is only supposed to happen if there is a soft hyphen embedded in the word. However I have verified to my own satisfaction that is not the case. Secondly, search and replace capabilities sometimes get confused. The word to be found gets placed in the change box and the word to be changed gets placed in the found box.

Finally the container MacLightning comes in is dangerous. The diskette is covered by a "protective back plate" of clear, thick plastic. To remove it you are instructed to "gently" lift the top edge away from the diskettes. This causes the plastic plate to bend and break. Unfortunately when the plate breaks, it generates two sharp edges. I cut my hand on it.

**System Requirements:** In theory the minimum requirement to use the MacLightning products is a Macintosh 512K with an external disk drive or a Macintosh Plus. While this is technically correct, to fully utilize the entire series requires a hard drive. Consider the following file sizes: the main dictionary is 296K, the legal dictionary 99K, the medical dictionary 211K, and the thesaurus 402K. This is more than a 1000K. Of course not everyone will need all the sections. But if you take the main dictionary, and part of thesaurus, you will barely put them, Word, and stripped down system file on a 800K diskette. The Lisa and Macintosh XL are not supported!

Products: MacLightning—Suggested Retail $99.95. MacLightning Legal Dictionary—Suggested Retail Price $99.95. MacLightning Medical Dictionary—Suggested Retail Price $99.95. MacLightning Thesaurus—Suggested Retail Price $49.95.

Developer: Target Software, 14206 Southwest 136th Street, Miami, Florida 33186, 1-800-622-5483. ●

**Three From CE continued from page 127**

endar. It can create calendars in three different methods; (1) an entire month on a page, (2) two months on a page, or (3) an illustration and a calendar on a page.

CalendarMaker allows for almost total customization: artwork can be directly imported from the scrapbook, MacPaint, and MacBillboard files; icons can be captured and placed on any date (e.g. put a birthday cake on your Aunt Sadie's birthday); any textual material can be printed in any font, style, or size; up to 255 characters of text can be added to any date; and background printing patterns can be edited to your heart's content. And if the editing capabilities of CalendarMaker is not good enough for you, its files can be saved to MacPaint/MacBillboard or MacDraw formats for further editing. CalendarMaker can even make a calendar in a foreign language. It gets the names for the months of the year and days of the week from the system file while printing. If you are running CalendarMaker from an international system file such as the Spanish system, it automatically prints a Spanish calendar.

CalendarMaker is relatively easy to use and an experienced Macintosh user should be up and running within 30 minutes. Its weakest point is the manual. It is too brief, only 14 pages, and does a poor job of explaining the program. CE should replace it with a more comprehensive one.

CalendarMaker is perfect for anyone who needs a custom calendar. I can easily see this program being used by families, schools, small businesses, departments in large businesses, and in fact by anyone who needs to share calendar data with any moderate size group of people.

CalendarMaker is available via shareware, selected dealers and from CE Software. The shareware version does not contain the icons or any sample files. The dealer version costs $30 and contains the manual and a number of sample files. ●

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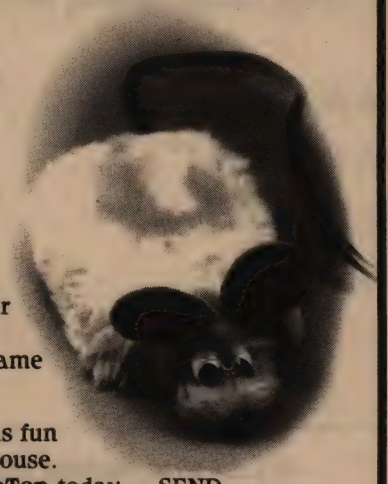

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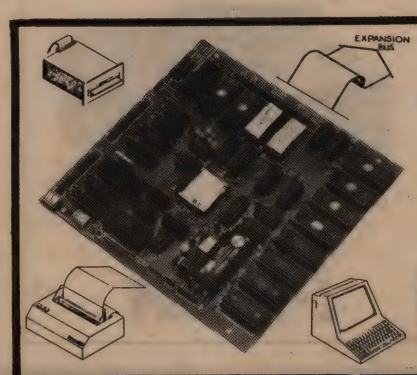


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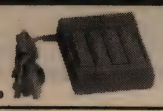

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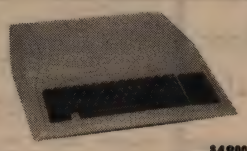

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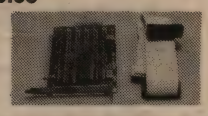

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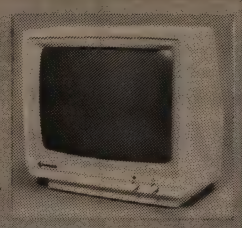

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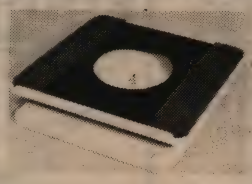
| PS150 | 150 WATT POWER SUPPLY XT COMPATABLE | $89.95 |
| PS200 | 200 WATT POWER SUPPLY AT COMPATABLE | $144.95 |

## Computer Monitor Swivel Stand



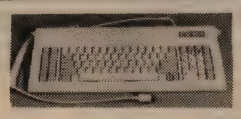
**$12.95**

- Helps to eliminate eye and muscle strain caused by incorrect positioning of screen.
- Tiltable 12.5° up and down.
- Can revolve 360°

## Stocking Stuffers! 5¼ DSDD GENERIC DISKETTES

Packaged in boxes of 10 w/sleeves. Labels and write-protect tabs
LIFETIME GUARANTEE
**10 for $7.95**
**100 for $59.50**

## Computer Keyboards



| | | |
|---|---|---|
| KB5150 | 5150 KEYBOARD | 59.95 |
| KB5160 | 5160 KEYBOARD XT | 79.95 |
| KB5151 | 5151 KEYBOARD XT/AT | 89.95 |

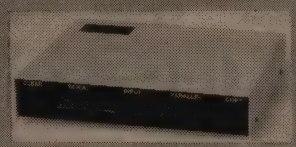
## Printer Buffers

| | | |
|---|---|---|
| PB64 | 64K PARALLEL PRINTER BUFFER | 129.95 |
| PB64SB | AS ABOVE WITH SWITCHBOX | 169.95 |
| PB256 | 256K PARALLEL PRINTER BUFFER | 189.95 |
| PB256SB | AS ABOVE WITH SWITCHBOX | 219.95 |

Centronics female connections

64K UNIVERSAL PRINTER BUFFER INTERFACE
**UPB64** 199.95
256K UNIVERSAL PRINTER BUFFER INTERFACE
**UPB256** 239.95

**CONVERTS:** Serial to Serial, Parallel to Serial, Parallel to Parallel, Serial to Parallel



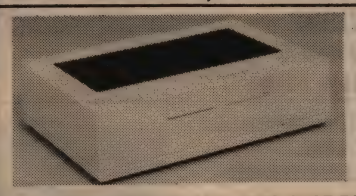
## Altex DATA TRANSFER SWITCHES

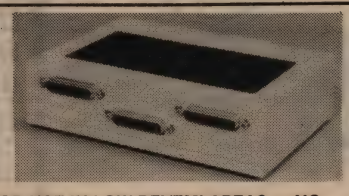
ROTARY SWITCHES — 25 AND 36 LINE

*Features:* STRONG METAL CASE • RFI/EMI PROTECTION • NO POWER REQUIRED • GOLD PLATED CONTACTS • COMPACT, BUILT TO LAST

| | | | | | |
|---|---|---|---|---|---|
| AB252 | 25 LINE TWO WAY | 64.95 | AB362 | 36 LINE TWO WAY | 89.95 |
| AB253 | 25 LINE THREE WAY | 79.95 | AB363 | 36 LINE THREE WAY | 106.95 |
| AB254 | 25 LINE FOUR WAY | 94.95 | AB364 | 36 LINE FOUR WAY | 119.95 |
| AB255 | 25 LINE FIVE WAY | 114.95 | AB365 | 36 LINE FIVE WAY | 144.95 |
| AB25X | 25 LINE CROSSOVER | 86.95 | AB36X | 36 LINE CROSSOVER | 116.95 |

## Economy PUSHBUTTON SWITCHBOXES



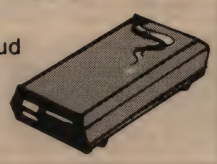


*Features:* DURABLE PLASTIC CASE FOR USE IN LOW RFI/EMI AREAS • NO POWER REQUIRED • PUSH BUTTON OPERATION • LIGHT WEIGHT

| | | | | | |
|---|---|---|---|---|---|
| AB25PB | DB-25 TWO WAY LINE | 39.95 | AB36PB | CENTRONICS TWO WAY 36 LINE | 44.95 |

## Super Modems

300/1200 Baud

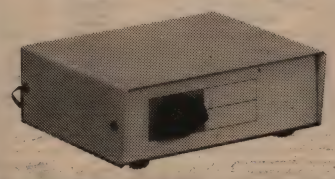


INTERNAL HAYES COMPATABLE
**SM12IN** 159.95
EXTERNAL HAYES COMPATABLE
**SM12EX** 199.95

*Ask about our Exclusive Custom Cable Service!*

## Economy ROTARY SWITCHBOXES

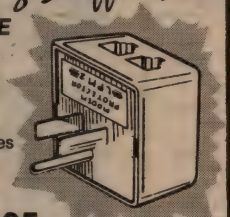
*Features:* DURABLE METAL CASE • RFI/EMI PROTECTION • NO POWER REQUIRED • SILVER PLATED CONTACTS • COMPACT



| | | |
|---|---|---|
| AB252E | DB-25 25 LINE TWO WAY | 39.95 |
| AB254E | DB-25 25 LINE FOUR WAY | 49.95 |
| AB25XE | DB-25 25 LINE CROSSOVER | 49.95 |
| AB362E | CENTRONICS 36 LINE TWO WAY | 49.95 |
| AB364E | CENTRONICS 36 LINE FOUR WAY | 59.95 |
| AB36XE | CENTRONICS 36 LINE CROSSOVER | 59.95 |

## Stocking Stuffers!

**MODEM SPIKE & SURGE PROTECTOR**



Help you and your modem to avoid annoying headaches caused by power surges.

only **$19.95**

*Solve your interconnection problems with our problem solvers DB-25 (RS-232).*

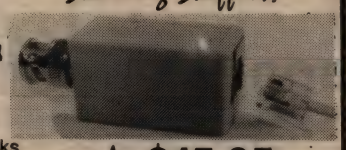
- GENDER CHANGER (AGC-M, AGC-F) $7.95
- GENDER CHANGER (AGC-36M, AGC-36F) $16.95
- NULL MODEM ADAPTER $9.95
- MINI PATCH BOX $9.95
- MINI TESTER $19.95
- SURGE PROTECTOR $14.95

*We carry the complete line of* **SAMS** *Computerfacts, books and guides!*

It's Here! ★ **BALUN**

**RG62 COAXIAL TO TWISTED-PAIR ADAPTER**

Stocking Stuffers!

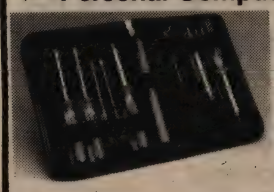


Economical Solution to coaxial cable cost!
Why use expensive cable for computer connections/networks when you can use this balun?

only **$15.95**

Altex Electronics Inc.

The **Personal Computer Tool Kit**



All the tools needed for working on and in the computer and peripherals neatly secured in a handsome black vinyl case.

**$29.95**

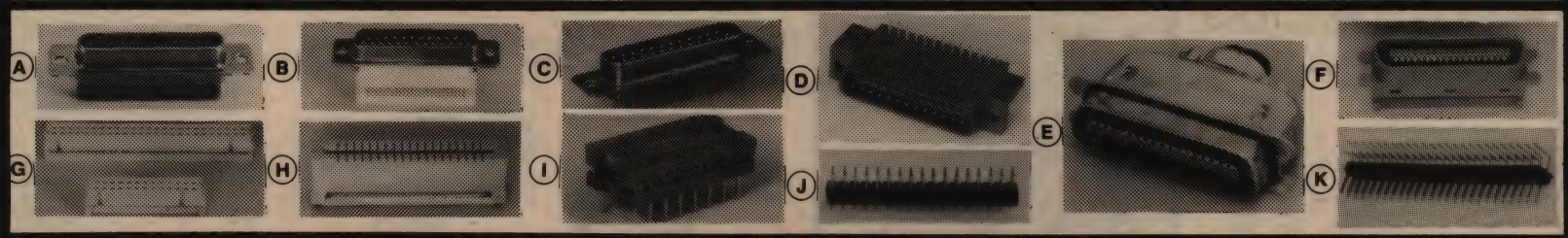
Special — **UNIVERSAL INTERFACE CONVERTER**

Connects: **SERIAL TO PARALLEL** or **PARALLEL TO SERIAL**

only **$99.95**

**CALL FOR INFORMATION**

## D-Series and Ribbon Cable Connectors




### (A) SOLDER POT

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| 9P | 0.75 | 0.56 | 0.45 |
| 9S | 0.80 | 0.60 | 0.48 |
| 15P | 1.03 | 0.78 | 0.62 |
| 15S | 1.10 | 0.83 | 0.66 |
| 19P | 1.62 | 1.22 | 0.97 |
| 19S | 1.62 | 1.21 | 0.97 |
| 25P | 1.10 | 0.83 | 0.66 |
| 25S | 1.20 | 0.97 | 0.78 |
| 37P | 2.14 | 1.61 | 1.28 |
| 37S | 2.41 | 1.81 | 1.45 |
| 50P | 2.62 | 2.38 | 2.18 |
| 50S | 3.70 | 3.36 | 3.08 |

### (B) RIBBON CABLE TYPE

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| IDC9P | 2.35 | 2.17 | 2.01 |
| IDC9S | 2.53 | 2.34 | 2.17 |
| IDC15P | 3.10 | 2.86 | 2.66 |
| IDC15S | 3.25 | 3.00 | 2.79 |
| IDC25P | 3.73 | 3.09 | 2.62 |
| IDC25S | 3.73 | 3.09 | 2.62 |
| IDC37P | 4.75 | 4.38 | 4.07 |
| IDC37S | 5.63 | 5.20 | 4.83 |
| IDC50P | 12.98 | 11.98 | 11.13 |
| IDC50S | 14.47 | 13.35 | 12.40 |

### (C) PC MOUNT STRAIGHT

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| P9P | 0.90 | 0.82 | 0.75 |
| P9S | 1.38 | 1.25 | 1.15 |
| P15P | 1.12 | 1.02 | 0.93 |
| P15S | 1.98 | 1.80 | 1.65 |
| P25P | 1.56 | 1.42 | 1.30 |
| P25S | 3.06 | 2.78 | 2.55 |
| P37P | 2.14 | 1.95 | 1.78 |
| P37S | 4.36 | 3.96 | 3.63 |
| P50P | 2.74 | 2.49 | 2.28 |
| P50S | 5.68 | 5.16 | 4.73 |

### (D) PC MOUNT RIGHT ANGLE

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| R9P | 1.60 | 1.45 | 1.33 |
| R9S | 1.62 | 1.47 | 1.35 |
| R15P | 1.52 | 1.38 | 1.27 |
| R15S | 1.54 | 1.40 | 1.28 |
| R25P | 1.96 | 1.78 | 1.63 |
| R25S | 1.98 | 1.80 | 1.65 |
| R37P | 2.94 | 2.67 | 2.45 |
| R37S | 2.98 | 2.71 | 2.48 |

### (E) 57 SERIES SOLDER TYPE

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| 57-24P | 3.68 | 3.35 | 3.07 |
| 57-24S | 3.60 | 3.27 | 3.00 |
| 57-36P | 3.00 | 2.67 | 2.40 |
| 57-36S | 3.66 | 3.33 | 3.05 |
| 57-50P | 5.12 | 4.65 | 4.27 |
| 57-50S | 5.92 | 5.38 | 4.93 |

### (F) 57 SERIES RIBBON CABLE TYPE

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| ID57-24P | 5.00 | 4.62 | 4.29 |
| ID57-24S | 5.50 | 5.08 | 4.71 |
| ID57-36P | 4.25 | 3.78 | 3.40 |
| ID57-36S | 5.50 | 5.00 | 4.58 |
| ID57-50P | 8.03 | 7.42 | 6.89 |
| ID57-50S | 7.52 | 6.94 | 6.44 |

### (G) IDS SOCKET CONNECTOR

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| IDS10 | 0.65 | 0.56 | 0.49 |
| IDS14 | 0.74 | 0.64 | 0.56 |
| IDS16 | 0.88 | 0.75 | 0.66 |
| IDS20 | 0.93 | 0.79 | 0.70 |
| IDS26 | 1.21 | 1.03 | 0.91 |
| IDS34 | 1.58 | 1.35 | 1.18 |
| IDS40 | 1.95 | 1.67 | 1.46 |
| IDS50 | 2.32 | 1.99 | 1.74 |
| IDS60 | 2.78 | 2.39 | 2.09 |

### (H) IDE EDGECARD CONNECTOR

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| IDE10 | 1.30 | 1.16 | 1.04 |
| IDE14 | 1.55 | 1.38 | 1.24 |
| IDE20 | 1.48 | 1.27 | 1.11 |
| IDE26 | 1.67 | 1.43 | 1.25 |
| IDE34 | 2.04 | 1.75 | 1.53 |
| IDE40 | 2.60 | 2.23 | 1.95 |
| IDE50 | 2.97 | 2.54 | 2.23 |

### (I) IDD DIP PLUG CONNECTOR

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| IDD14 | 0.85 | 0.77 | 0.71 |
| IDD16 | 0.95 | 0.86 | 0.79 |
| IDD24 | 1.65 | 1.50 | 1.38 |
| IDD40 | 2.75 | 2.50 | 2.29 |

### (J) BREAKAWAY HEADER STRIPS STRAIGHT

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| IDH10B | 0.28 | 0.25 | 0.23 |
| IDH14B | 0.39 | 0.35 | 0.32 |
| IDH16B | 0.44 | 0.40 | 0.37 |
| IDH20B | 0.55 | 0.50 | 0.46 |
| IDH26B | 0.72 | 0.65 | 0.60 |
| IDH34B | 0.94 | 0.85 | 0.78 |
| IDH40B | 1.10 | 1.00 | 0.92 |
| IDH50B | 1.38 | 1.25 | 1.15 |

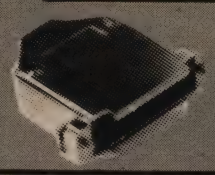
### (K) BREAKAWAY HEADER STRIPS RIGHT ANGLE

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| IDH10BR | 0.36 | 0.33 | 0.30 |
| IDH14BR | 0.51 | 0.46 | 0.42 |
| IDH16BR | 0.58 | 0.53 | 0.48 |
| IDH20BR | 0.73 | 0.66 | 0.60 |
| IDH26BR | 0.94 | 0.86 | 0.79 |
| IDH34BR | 1.23 | 1.12 | 1.03 |
| IDH40BR | 1.45 | 1.32 | 1.21 |
| IDH50BR | 1.81 | 1.65 | 1.51 |

### EMPTY CRIMP SHELLS

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| C9P | 0.70 | 0.46 | 0.32 |
| C9S | 0.70 | 0.48 | 0.34 |
| C15P | 0.73 | 0.52 | 0.36 |
| C15S | 0.73 | 0.53 | 0.37 |
| C25P | 0.75 | 0.54 | 0.38 |
| C25S | 0.75 | 0.57 | 0.40 |
| C37P | 0.96 | 0.87 | 0.80 |
| C37S | 1.00 | 0.91 | 0.83 |
| C50P | 1.12 | 1.02 | 0.93 |
| C50S | 1.14 | 1.04 | 0.95 |

## HOODS-COVERS



### GREY HOODS

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| GH9 | 0.68 | 0.47 | 0.42 |
| GH15 | 0.80 | 0.56 | 0.50 |
| GH25 | 0.85 | 0.64 | 0.58 |
| GH37 | 1.06 | 0.96 | 0.88 |
| GH50 | 1.10 | 1.00 | 0.92 |

### SHIELDED HOODS

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| SH9 | 0.75 | 0.64 | 0.56 |
| SH15 | 0.76 | 0.65 | 0.57 |
| SH25 | 0.81 | 0.69 | 0.61 |
| SH37 | 1.72 | 1.56 | 1.43 |
| SH50 | 2.37 | 1.90 | 1.58 |

### METAL HOODS

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| MH9 | 1.75 | 1.56 | 1.40 |
| MH15 | 2.00 | 1.78 | 1.60 |
| MH25 | 2.13 | 1.89 | 1.70 |

### DUAL HOODS

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| DH25 | 1.13 | 0.90 | 0.75 |
| DH37 | 1.17 | 0.94 | 0.78 |

### AMP HOOD

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| AH25 | 1.25 | 1.00 | 0.83 |

### SIDE OR REAR ENTRY HOOD

| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| SRH-9 | 1.00 | 0.80 | 0.67 |
| SRH-25 | 1.13 | 0.90 | 0.75 |

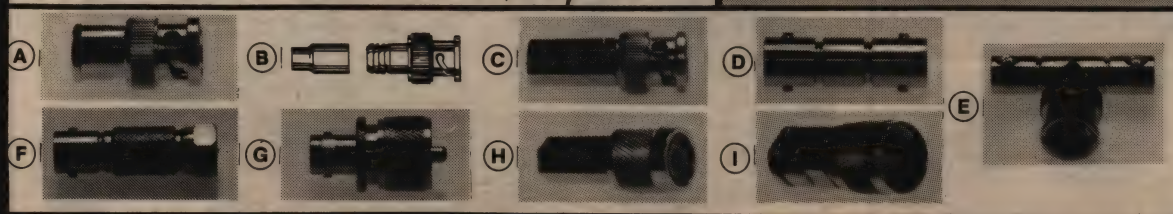
### CRIMP CONTACTS

| PART # | PRICE/QTY 1-99 | 100-999 | 1K-4999 |
|---|---|---|---|
| CP20P | 0.080 | 0.043 | 0.038 |
| CP20S | 0.100 | 0.054 | 0.048 |

### MACHINED CONTACTS

| PART # | PRICE/QTY 1-99 | 100-999 | 1K-4999 |
|---|---|---|---|
| MCP20P | 0.18 | 0.140 | 0.110 |
| MCP20S | 0.20 | 0.160 | 0.125 |

## Coaxial Cable Connectors and Adapters




### (A) BNC CONNECTORS SOLDER TYPE

| PART # | DESCRIPTION | PRICES 1-49 | 50-99 | 100-499 |
|---|---|---|---|---|
| BNC58S | BNC solder for RG-58 | 1.95 | 1.18 | 0.98 |
| BNC59S | BNC solder for RG-59 | 1.95 | 1.18 | 0.98 |

### (B) CRIMP TYPE

| PART # | DESCRIPTION | PRICES 1-49 | 50-99 | 100-499 |
|---|---|---|---|---|
| BNC58C | BNC crimp on for RG-58 | 1.95 | 1.50 | 1.25 |
| BNCF58C | Female crimp for RG-58 | 1.95 | 1.40 | 1.17 |
| BNC59C | BNC crimp on for RG-59 | 1.95 | 1.30 | 1.08 |
| BNCF59C | Female crimp for RG-59 | 1.95 | 1.50 | 1.25 |
| BNC174C | BNC male crimp for RG174 | 1.95 | 1.50 | 1.25 |

### (C) BNC TWIST-ON

| PART # | DESCRIPTION | PRICES 1-49 | 50-99 | 100-499 |
|---|---|---|---|---|
| BNC-T059 | BNC twist on for RG-59 & 62 | 1.63 | 1.30 | 1.08 |
| BNC-T058 | BNC twist on for RG-58 | 2.08 | 1.92 | 1.79 |

### (D)(E) BNC ADAPTER'S

| PART # | DESCRIPTION | PRICES 1-24 | 25-49 | 50-UP |
|---|---|---|---|---|
| BNC-T | BNC "T" adapter | 2.75 | 2.18 | 1.82 |
| BNC-FS | BNC female inline splice | 1.65 | 1.30 | 1.08 |
| BNC-MS | BNC male inline splice | 1.95 | 1.64 | 1.37 |
| BNC-CMFT | BNC chassis mount feed thru | 3.25 | 2.60 | 2.17 |
| BNC-BR | BNC bulkhead receptacle | 1.50 | 1.14 | 0.95 |
| BNC-RA | BNC right angle adapter | 2.75 | 2.08 | 1.73 |
| BNC-58T | 50 ohm terminator | 2.95 | 2.69 | 2.50 |
| BNC-59T | 75 ohm terminator | 2.95 | 2.69 | 2.50 |

### (F)(G) COAXIAL CONNECTOR ADAPTERS

| PART # | DESCRIPTION | PRICES 1-24 | 25-49 | 50-UP |
|---|---|---|---|---|
| F-BNC | F female to BNC male | 1.95 | 1.50 | 1.20 |
| BNC-F | BNC female to F male | 1.75 | 1.38 | 1.10 |
| RCA-BNC | RCA female to BNC male | 1.75 | 1.23 | 0.98 |
| BNC-RCA | BNC female to RCA male | 1.75 | 1.23 | 0.98 |
| F-RCA | F female to RCA male | 1.75 | 1.23 | 0.98 |
| RCA-F | RCA female to F male | 1.75 | 1.25 | 1.00 |
| RCA-UHF | RCA female to UHF male | 1.75 | 1.25 | 1.00 |
| BNC-UHF | BNC female to UHF male | 2.50 | 1.90 | 1.52 |
| UHF-BNC | UHF female to BNC male | 2.50 | 1.88 | 1.50 |
| F-UHF | F female to UHF male | 1.95 | 1.50 | 1.20 |
| UHF-F | UHF female to F male | 1.75 | 1.33 | 1.06 |

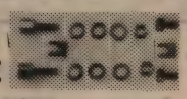
### (H) TNC CONNECTORS

| PART # | DESCRIPTION | PRICES 1-24 | 25-49 | 50-UP |
|---|---|---|---|---|
| TNC-59C | TNC male crimp for RG-59 | 2.50 | 2.00 | 1.82 |
| TNC-58C | TNC male crimp for RG-58 | 2.95 | 2.40 | 2.18 |
| TNC-T059 | TNC twist on for RG-59, 62 | 3.95 | 3.20 | 2.91 |
| TNC-T058 | TNC twist on for RG-58 | 3.95 | 3.20 | 2.91 |
| TNC-IS | TNC inline splice | 4.25 | 3.50 | 3.18 |
| TNC-RA | TNC right angle | 7.50 | 6.00 | 5.45 |

### (I) TWIN-AX CONNECTORS

| PART # | DESCRIPTION | PRICES 1-24 | 25-49 | 50-UP |
|---|---|---|---|---|
| TWX-MC | Male twinax connector | 6.00 | 5.54 | 5.14 |
| TWX-FIA | Female inline adapter | 6.00 | 5.54 | 5.14 |
| TWX-CM | Female bulkhead receptical | 10.00 | 9.23 | 8.57 |
| TWX-T | Twinax "T" adaptor | 11.95 | 9.23 | 8.57 |

## D-SERIES HARDWARE



| PART # | PRICE/QTY 1-49 | 50-99 | 100-499 |
|---|---|---|---|
| MDH-1 | 0.55 | 0.36 | 0.30 |
| FDH-2 | 0.75 | 0.56 | 0.46 |

## RS-232 WALL PLATES

| PART # | PRICE/QTY 1-9 | 10-24 | 25-49 |
|---|---|---|---|
| WP9-1, WP15-1, WP25-1 | 1.88 | 1.36 | 1.25 |
| WP9-2, WP15-2, WP25-2 | 2.13 | 1.55 | 1.42 |

**Extractor Tool**
Removes crimp contacts (Inserts also.)
EXT-1 **$2.75**

**Crimping Tool**
Professional ratchet type
CT-1645
**$79.95**

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|---|---|---|---|
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| MP-6 | 6 pin modular plug 6 x 6 | 0.25 | 15.95 |
| MP-8 | 8 pin modular plug 8 x 8 | 0.35 | 26.95 |

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| PART # | DESCRIPTION | 100 EA |
|---|---|---|
| MW4-100 | 100 ft. 4 conductor | 6.95 |
| MW4-500 | 500 ft. 4 conductor | 29.95 |
| MW4-1000 | 1000 ft. 4 conductor | 49.95 |
| MW6-100 | 100 ft. 6 conductor | 8.95 |
| MW6-500 | 500 ft. 6 conductor | 39.95 |
| MW6-1000 | 1000 ft. 6 conductor | 64.95 |
| MW8-100 | 100 ft. 8 conductor | 12.95 |
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| MW8-1000 | 1000 ft. 8 conductor | 99.95 |

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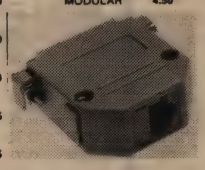
- MA-6F—RS-232 FEMALE TO 6 PIN MODULAR 4.50
- MA-8M—RS-232 MALE TO 8 PIN MODULAR 4.95
- MA-8F—RS-232 FEMALE TO 8 PIN MODULAR 4.95



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| PPC301-10 | 10 ft. | 12.00 |
| PPC301-15 | 15 ft. | 19.95 |
| PPC301-25 | 25 ft. | 24.95 |

**IBM CABLE ASSEMBLIES**

| PART # | DESCRIPTION | PRICES |
|---|---|---|
| ATSC-6 | 6 ft. AT serial printer cable | 14.95 |
| KEC-10 | 10 ft. keyboard extention | 3.95 |
| MEC-10 | 10 ft. monitor extention | 3.95 |
| RGB-3 | 3 ft. RGB monitor cable | 8.95 |
| VMC-10 | 10 ft. video cable RCA to RCA | 2.50 |
| DDC-22 | dual floppy controller cable | 6.95 |
| HDC-22 | hard drive controller cable | 7.95 |
| MPC-6 | power cord | 3.95 |

**DB25 CABLE ASSEMBLIES**

| PART # | DESCRIPTION | PRICES |
|---|---|---|
| 25MM-6 | 6 ft. male to male | 14.95 |
| 25MM-10 | 10 ft. male to male | 19.95 |
| 25MM-25 | 25 ft. male to male | 24.95 |
| 25MF-6 | 6 ft. male to female | 14.95 |
| 25MF-10 | 10 ft. male to female | 19.95 |
| 25MF-25 | 25 ft. male to female | 24.95 |

**CENTRONICS CABLE ASSEMBLIES (36 pin male to male)**

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**HARD DRIVE CABLE ASSEMBLIES**

| PART # | DESCRIPTION | PRICE |
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| HDC-22 | 22" hard drive cable assy. | 8.50 |

**RADIO SHACK PARALLEL PRINTER CABLE**

| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 36P-34E | 36 pin male 34 pin edg.crd. | 0.50 + .08 per ft. |

**IDE EDGECARD TO IDE EDGCARD**

| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 10E-10E | 10 pin edg.crd. to edg.crd. | 3.80 + .20 per ft. |
| 14E-14E | 14 pin edg.crd. to edg.crd. | 4.00 + .28 per ft. |
| 20E-20E | 20 pin edg.crd. to edg.crd. | 4.50 + .40 per ft. |
| 26E-26E | 26 pin edg.crd. to edg.crd. | 5.30 + .52 per ft. |
| 34E-34E | 34 pin edg.crd. to edg.crd. | 5.90 + .68 per ft. |
| 40E-40E | 40 pin edg.crd. to edg.crd. | 7.00 + .80 per ft. |
| 50E-50E | 50 pin edg.crd. to edg.crd. | 8.50 + 1.00 per ft. |

**D-SERIES**

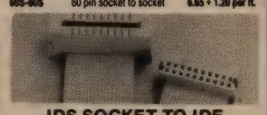
| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 9P-9P | 9 pin male to male | 5.04 + .18 per ft. |
| 9P-9S | 9 pin male to female | 5.06 + .18 per ft. |
| 9S-9S | 9 pin female to female | 6.08 + .18 per ft. |
| 15P-15P | 15 pin male to male | 7.44 + .30 per ft. |
| 15P-15S | 15 pin male to female | 7.62 + .30 per ft. |
| 15S-15S | 15 pin female to female | 7.90 + .30 per ft. |
| 25P-25P | 25 pin male to male | 8.96 + .50 per ft. |
| 25P-25S | 25 pin male to female | 8.62 + .50 per ft. |
| 25S-25S | 25 pin female to female | 10.28 + .50 per ft. |
| 37P-37P | 37 pin male to male | 11.40 + .74 per ft. |
| 37P-37S | 37 pin male to female | 12.46 + .74 per ft. |
| 37S-37S | 37 pin female to female | 13.52 + .74 per ft. |
| 50P-50P | 50 pin male to male | 25.96 + 1.00 per ft. |
| 50P-50S | 50 pin male to female | 27.45 + 1.00 per ft. |
| 50S-50S | 50 pin female to female | 28.94 + 1.00 per ft. |

**57 SERIES RIBBON CABLE ASSEMBLIES**

| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 5724P-P | 24 pin male to male | 10.00 + .48 per ft. |
| 5724P-S | 24 pin male to female | 10.50 + .48 per ft. |
| 5724S-S | 24 pin female to female | 11.00 + .48 per ft. |
| 5736P-P | 36 pin male to male | 8.00 + .72 per ft. |
| 5736P-S | 36 pin male to female | 10.00 + .72 per ft. |
| 5736S-S | 36 pin female to female | 12.00 + .72 per ft. |
| 5750P-P | 50 pin male to male | 16.75 + 1.00 per ft. |
| 5750P-S | 50 pin male to female | 16.25 + 1.00 per ft. |
| 5750S-S | 50 pin female to female | 15.75 + 1.00 per ft. |

**IDS SOCKET TO IDS SOCKET**

| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 10S-10S | 10 pin socket to socket | 2.00 + .20 per ft. |
| 14S-14S | 14 pin socket to socket | 2.50 + .28 per ft. |
| 16S-16S | 16 pin socket to socket | 2.75 + .32 per ft. |
| 20S-20S | 20 pin socket to socket | 2.85 + .40 per ft. |
| 26S-26S | 26 pin socket to socket | 3.90 + .52 per ft. |
| 34S-34S | 34 pin socket to socket | 4.10 + .68 per ft. |
| 40S-40S | 40 pin socket to socket | 4.50 + .80 per ft. |
| 50S-50S | 50 pin socket to socket | 6.15 + 1.00 per ft. |
| 60S-60S | 60 pin socket to socket | 6.65 + 1.20 per ft. |



**IDS SOCKET TO IDE EDGCARD**

| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 10S-10E | 10 pin socket to edg.crd. | 3.30 + .20 per ft. |
| 14S-14E | 14 pin socket to edg.crd. | 3.50 + .28 per ft. |
| 20S-20E | 20 pin socket to edg.crd. | 3.75 + .40 per ft. |
| 26S-26E | 26 pin socket to edg.crd. | 4.75 + .52 per ft. |
| 34S-34E | 34 pin socket to edg.crd. | 5.40 + .68 per ft. |
| 40S-40E | 40 pin socket to edg.crd. | 6.45 + .80 per ft. |
| 50S-50E | 50 pin socket to edg.crd. | 7.85 + 1.00 per ft. |

**IDD DIP PLUG TO IDD DIP PLUG**

| PART # | DESCRIPTION | PRICE |
|---|---|---|
| 14D-14D | 14 pin dip plug cable | 2.00 + .20 per ft. |
| 16D-16D | 16 pin dip plug cable | 2.75 + .32 per ft. |
| 24D-24D | 24 pin dip plug cable | 3.75 + .48 per ft. |
| 40D-40D | 40 pin dip plug cable | 7.50 + .80 per ft. |

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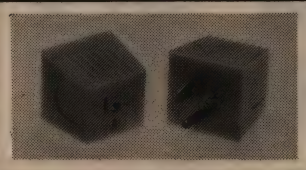

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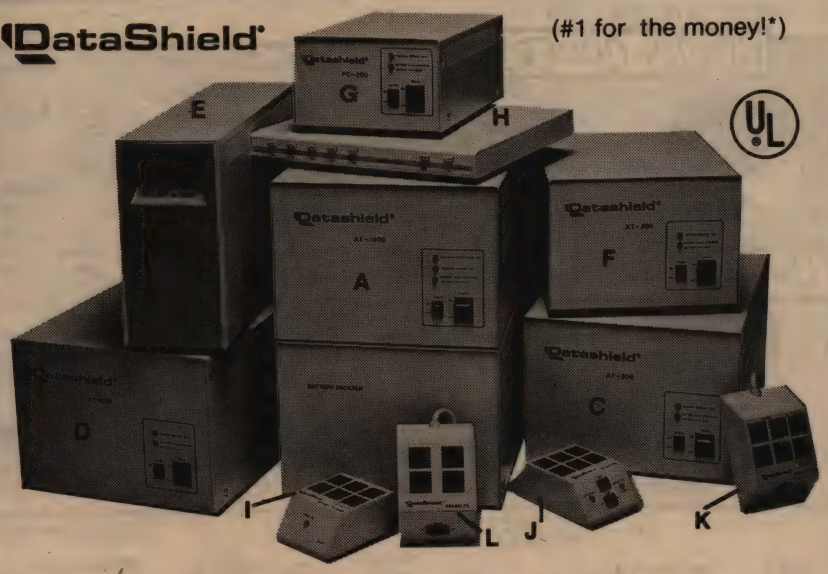


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G. PC 200A — 200 watt backup power source with battery, 24 lbs.-$255.00
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J. S100 — Surge protector, 6 socket, low voltage alarm, super filters, 1 lb.-$55.00
K. S85 — Surge protector, 6 socket, super filters, on/off switch, 1 lb.-$49.50
L. S75 — Surge protector, 4 socket, on/off switch, 1 lb.-$38.50

*As tested by the Professional Software Programmers Association for evalution by Computer Retail News Magazine.

**Home Accountant continued from page 117**

move on to the next field by using the Tab key. Tabs will position the cursor in the next field, it will position the cursor at the beginning field (Check Number) again.

The next field on the check is the date. You should enter the date associated with the check, using the backspace key for corrections if needed. To make this easier still, you can just enter an = and Home Accountant will enter today's date for you. Similarly, an = in the Check Number field will enter next number in succession. This is a real time-saver.

Once you have entered several checks using today's date, you may want to enter some that will go out in the mail tomorrow. You will have to manually enter tomorrow's date on the first of these, and an = on subsequent checks will also enter tomorrow's date.

You can then easily Tab to the Payee field. You can use any combination of printing characters, but it only accepts 23 characters (not allowing you to fill the line). KISS applies, so instead of "First Federal Savings & Loan of MyTown" you might have to abbreviate it to "First Federal of Mytown", which is exactly 23 characters. This is not exactly a limitation for me, though, I have made out mortgage payments for 10 years to FFS/LoT. The bank doesn't care—as long as it comes on time.

The dollar amount is entered in numbers, then Home Accountant automatically translates it into a character string for the subsequent line.

The Memo field is the only field not used by Home Accountant. This field is just for your purposes: feel free to be as cryptic as you like. You may have to because the field is only twelve characters long. I find this to be a limitation because I tend to be verbose in my Memo fields. Because I don't like to write a bunch of small checks, I like to pay for my Sunday newspaper, for example, a year at a time: the memorandum field should be "5/4/86-5/19/87", but that is 14 characters.

The next field is the For field. In this area you enter the Home Accountant category, by which information will be sorted for budgets and reports. You can have up to 80 expense categories. The names of the categories must be 10 or fewer characters, all of them significant. If you make a mistake and enter "groceries" when the expense category you already defined was "grocery," Home Accountant will ask you if you want this new category added. The category names are saved as uppper case strings, so "grocery," "groCEry," and "GROCERY" will all refer to the same category.

The last field is a box you can click on with the mouse. The Tax Deductible flag will be set (or reset, if already set). Using a report generator, you can very simply get a listing of all the items with a Tax Deductible flag.

"Bank Drafts," as Home Accountant calls non-check checking account debits, are filled in the same way as checks. You can create new expense categories or use some of those defined from entering checks.

Of course, Deposits are entered the same way as Checks and Drafts, but use Income "For" categories. You are allowed up to 16 income categories. All the same rules apply.

Once a check, draft, or deposit is filled out to your satisfaction, you must enter an explicit command to enter this item against your account. This gives you time to look the item over and not enter it until you are sure it is correct. (If Home Accountant accepted each item when all fields were filled, it would be impossible to "Tab around" to get back to a top field you would like to change.)

You can enter this Accept Entry command from a mouse selection from a pull-down menu or use function key #3. Home Accountant has its most commonly used features duplicated on the function keys, just to pacify users like me. If you have a lot of checks to enter, you can do a whole stack of them and never move your hands away from the keyboard, and just whip them right off. Now that's a human interface.

Once you command Home Accountant to accept the entry, the check register and the balance are updated to reflect the entry. If you have a color monitor then checks, drafts, and deposits will appear in different colors. You will see the check number, date, payee, amount, and the expense/income category. There is also a column for your "cleared" flag, indicating whether the item has been processed by the bank. Drafts are assumed to be immediately cleared by the bank, since they are usually handled in-bank. Usually, though, you will wait for your statement until you are sure everything cleared the bank.

The order in which your check register appears is selectable from a pull-down menu. Home Accountant defaults to putting everything in order by entry number. The writers even explain that you should use the check number for your deposit number to make the entries look right. I favored just leaving my deposits unnumbered and putting my entries in order by date, but this causes some small problems when generating reports. I have since saved myself the trouble and conceded to organization by entry numbers.

My only complaint with the check register is that only five entries are visible at a time. Scroll bars allow you to move through any number of entries

**continued on page 253**

Income Items

| Category Average | Projected Daily | Projected Monthly | Projected Annually |
|---|---|---|---|
| PAY | 113.18 | 3395.40 | 41310.70 |
| Income Total: | 113.18 | 3395.40 | 41310.70 |

Expense Items

| Category Average | Projected Daily | Projected Monthly | Projected Annually |
|---|---|---|---|
| AUTO RPAIR | 4.44 | 133.20 | 1620.60 |
| CAR PMT | 22.96 | 688.80 | 8380.40 |
| CHRISTMAS | 9.28 | 278.40 | 3387.20 |
| CLEANING | 1.24 | 37.20 | 452.60 |
| GASOLINE | 1.81 | 54.30 | 660.65 |
| GROCERY | 7.60 | 228.00 | 2774.00 |
| MORTGAGE | 20.14 | 604.20 | 7351.10 |
| UTILITY | 8.99 | 269.70 | 3281.35 |
| VACATION | 37.03 | 1110.90 | 13515.95 |
| VET | 2.62 | 78.60 | 956.30 |
| Expense Total: | 116.15 | 3484.50 | 42394.75 |

FIGURE 3

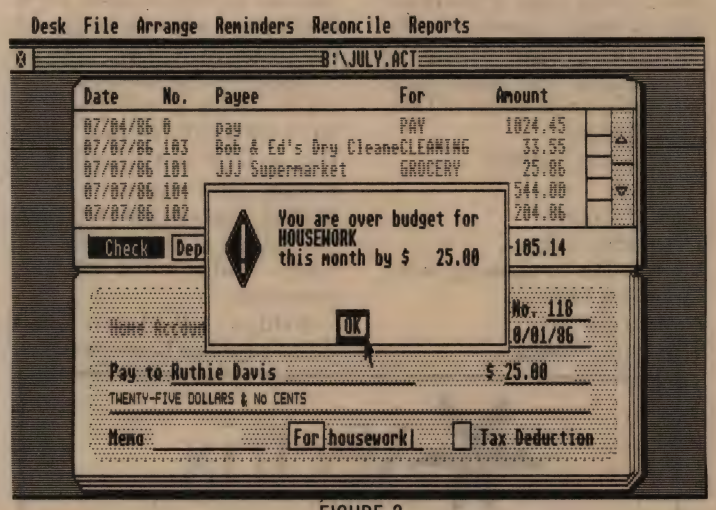


FIGURE 2

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**Contract Bridges continued from page 118**

lesson builds on the previous lesson. You may be tempted to start writing all this information down, because it comes at you fast and furious about halfway through the lessons. But that is really silly. If you are serious about bridge, at some time you will want to buy a beginners bridge book. Many are available at your paperback bookstore.

(A side note: bridge enthusiasts can be somewhat fanatical about the text they use as their Contract Bridge bible. I am partial to *Five Weeks To Winning Bridge* by Sheinwold, but if Compubridge is your first exposure to bridge I suggest you buy bridge texts written by Shirley Silverman, since that is the text Harnish references. I checked two bookstores locally and found Sheinwold and Goren in both, but didn't find Silverman.)

Which brings me to my next point: it is unlikely you will learn to play bridge from the several hundred lines of text in this package. It is a noble effort and the lessons are clear and complete, but I don't believe that a beginner could get a feel for the game just from the Compubridge texts. It would help if Compubridge would provide a means to print each complete lesson.

Most lessons have an associated quiz. The quiz challenges you to test what you learned in the lesson. Randomly generated hands will be generated for your scrutiny. You are supposed to use the mouse to enter your answer, then Compubridge will tell you if your entry is correct. If you were correct, Compubridge will say "Correct" with no explanation. Otherwise, it will tell you why it thinks you are incorrect. There is another option: You can read the question and determine what you think the answer is and why, but enter nothing. You can select the ANSWER option without entering anything and you will be given the answer, along with the explanation. This is especially good for calculating points in a hand: IF you accidentally miscount a hand with two offsetting errors, you can enter the number and Compubridge will find you Correct. However, if you just display the answer you will see how it calculates the points.

It is nice to have the opportunity to play a bridge quiz any time, rather than waiting for the weekly one in the newspaper. However, each of the quizzes tests your command of a single aspect of Contract Bridge:

1 Beginning bidding
2 Scoring
3 Point Count
4 Opening Bids
5 Responses to opening bids
6 Forcing bids
7 Overcalls
8 Opening Leads

These are powerful tools, especially for honing your skills in the basics. The tutorial gives you enough information that you should be able to work the quizzes. Since everyone's Contract Bridge Religion is slightly different, the tutorials provide the information about how the quiz answers were formulated. BASIC wizards may enjoy going through the source to modify the algorithms slightly to match their bible's version of, for example, calculating point counts.

I haven't encountered any bugs in the software except that I was unable to make a screen dump of the displays. I enjoyed the quizzes in Compubridge. But it's still no replacement for a good bridge book.

Bridge 4.0, $29.95 by Artworx, 150 N. Main Street, Fairport, NY 14450; 800/828-6573.

Now THIS is the way to learn Contract Bridge. Bridge 4.0 provides you with a second, third and fourth for bridge whenever the spirit moves you.

Like Compubridge, Bridge 4.0 comes with no manual, only a single sheet of instructions. They aren't as concise as the Compubridge instructions because the instructions cover loading and running Bridge 4.0 on a variety of computers.

Bridge 4.0 is invoked from BASIC with a command to RUN BRIDGE. It takes a long time to load, but after that no further disk access will be needed. You can put your copy of Bridge 4.0 and BASIC away. Bridge 4.0 is not copy protected.

Bridge 4.0 doesn't use GEM's rubber boxes or dialog boxes. The graphics are entirely acceptable, and in many cases are superior to the standard GEM features.

The opening display begins with the question, "Would you like an opening hand every deal?" I like the option, although I would rather get random hands unless I want to work on my Slam game. The bidding display follows. (See Fig. 1) My hand (South) appears, with a table to keep track of the bidding and a mousepad to enter my bid at my turn. The graphics are pretty standard, but none of the suit symbols (clubs, diamonds, hearts, or spades) are used. Instead, the author uses the letters C, D, H, S. In theory, it sounds very clear, but on a monochrome monitor the suits are sometimes confused when you just glance up. In color (medium res) I have never experienced any problems with that.

On the first hand, South will start the bidding (it had to start somewhere). On subsequent hands, the first bidder will be West, then North, then East and so forth, as with the deal.

Your bid (South's) is entered with the mouse. Then West will enter his bid, then your partner, then East. Three passes ends the bidding. There is a provision to be able to bid "Double," but no "Redouble" is provided. Obviously, there is no guarantee that your partnership (North/South) will win the bid.

After the bidding is over, you can examine the display as long as you like to review the bidding. Then a click of the mouse brings up a display for the play of the hand. At the top of the display there is a status line showing which trick is in play, the number of tricks won so far by each of We and They, the bid, and whose turn it is to play. South's (your) hand will always be displayed, along with the dummy. (See Figure 2.)

If your opponents won the bid, you just play South's hand. If you are the declarer, you play both your hand and North, the dummy. On the other hand, if you are dummy, you can't just get up for fresh coffee and return after the hand is over...instead you have to play the South (the dummy) and North as well. You might think that is unfair: if computer-North bid it, he ought to have to find a way to play it out. But relax...North won't bid it unless there's a good indication that North/South will make it. (Your computer-partner and computer-opponents learned bridge from Goren.)

Cards are played by select-

**continued on page 255**

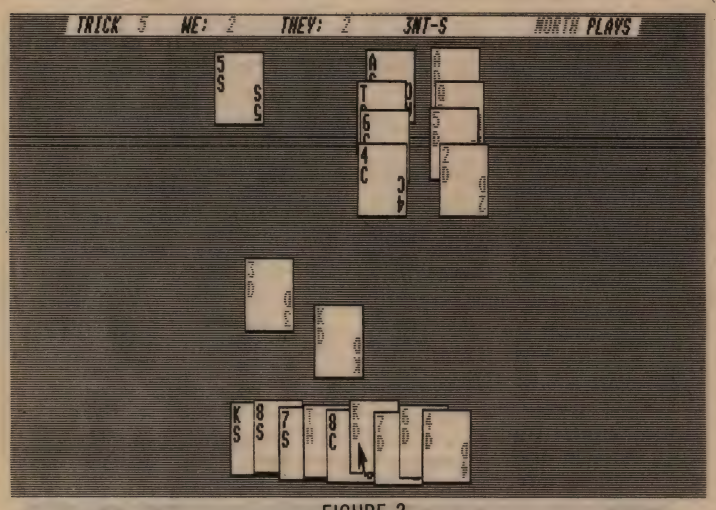


FIGURE 2

FCC APPROVED SEAGATE HARD DISKS FOR XT, PC, AT & COMPATIBLES

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|---|---|---|---|
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| *20 MB SEAGATE GATE (ST 225) ½Ht 65Ms | $285 | $272 | $265 |
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**Home Accountant continued from page 251**

but I would still like to see more entries at a time.

There are search options for your check register. You must organize your register with whatever field you want to search as the first field, for example, if you want to find a check payable to Bob & Ed's Dry Cleaners, make Payee your first field. Then select Search and enter "B." This should locate all payees with the first character "B". Since most people won't want to leave the check register in this order, a click of the mouse changes the organization back to whatever you preferred.

At any time you can select an entry from the check register and edit it or copy it or both. This is a real labor saving device, considering that you generally do business with the same people many times. You can copy a month-old check to Bob & Ed's Dry Cleaners, update the Check number and Date fields each with an =, then change the amount to today's purchase. This sure beats typing the whole check in again.

Home Accountant will even remind you when bills are due. Since your mortgage and car payments are generally due monthly and the amounts are constant, you can let Home Accountant remind you that these payments are due. You just enter the date of the first reminder and you will be reminded monthly on this date thereafter. This is a useful feature because it allows you to let the system make the checkbook entry as well, if chosen. It will not make the decision for you, though. You can still review your balance and the other payments to be made and choose to delay this payment if you like.

You can use reminders for variable amounts too. You may choose to make a reminder for your water bill, at roughly $25. When the bill arrives, update the reminder to the exact amount of the bill and let Home Accountant update the register for you.

Home Accountant will also allow you to establish a budget for yourself, based on the expense categories you have established. You can click on the For box of a check, deposit, or draft and you will get to see the listing of the expense and income categories you have used. From here, you can examine the buget of any of these categories.

A dialog box will appear, in which all your actual expenses of each month in this category are displayed. You can enter whatever you would like to be considered a monthly budget for the item. They can vary from month to month, if you like, but most will be constant. For example, you might elect to make your MORTGAGE expense category's budget a constant $455 for all 12 months. Home Accountant will provide an easy means to fill the 12 months with a single value.

On the other hand, in the sweltering south, your UTILITY expense category's budget will be different for the summer than other times of the year. You may choose to fill the 12 months UTILITY budget with $150, then edit May, June, July, August and September budgets to $250, to accomodate the higher electric bills for the hot months.

I even chose to arrange a Christmas expense budget, with no money allocated for January through August. Then September through November each had a $200 allowance for Christmas shopping.

With your budgets firmly established, you can go back to making checking account entries. There is a Budget Warning option you may now select. If you have a dry cleaning budget of $50 per month and you write one check each week for $15, the fourth check will trigger a dialog box that reminds you that you are over your CLEANING budget by $10 this month, with an OK button. Well, we know it is not OK to be over one's dry cleaning budget, but we sure appreciate the reminder. Nag, nag, nag. That's why Home Accountant made Budget Warning an option. See Figure 2.

Not only does all of the above apply to checking accounts, you can likewise organize your charge accounts. You should separate your charge accounts into files that can be worked with singly. This should allow you to keep very careful track of all your credit transactions.

When your statement comes from the bank, you can use Home Accountant "Reconcile" features. One bug, the writers note, is that Home Accountant will not reconcile to a negative balance. The writers recommend you reconcile to zero, then the difference between your balance and the zero balance should be your negative balance. This could be an annoyance if you have a credit line associated with your checking account and the bank elects to show your balance always negative.

If all of the above sounds like a lot of work, this is where all that work really pays off: Home Accountant will generate reports of your transactions. All reports invoked will prompt you, via dialog boxes, for a destination. You can show it, print it, or save it in HabaWriter format. I should note that HabaWriter format is not pure printing—ASCII, so you may have trouble using the file with some other editors. I should also point out that after a report is

**continued on page 254**


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### Hacking The ST
continued from page 118

numbers given for the xbios call are off by 16. The GEMDOS day is contained in bits 0 through 4, the month is in bits 5 through 8 and the year is in bits 9 through 15. Just as in the xbios date, there is an offset of 1980 in the year field. To get the correct year, add the value in bits 9 through 15 to 1980.

The odd thing about this set up is that the GEMDOS and the system time and date are two different clocks. The program in Listing 2 will show the difference if you turn the ST on and don't set the clock with the desk accessory. Under these conditions the two times are vastly different.

I don't know the reason for maintaining two different clocks, but I suspect it is because the GEMDOS routines were in place when DRI wrote it and they just left it in place when they brought GEMDOS over to the ST.

Another interesting bit of information about the two clocks, the system clock doesn't even run unless you set it first. The GEMDOS clock picks up and starts running all by itself. To see what I mean, run the program and write down the two times, then run the program again about a minute later. The GEMDOS time will have changed, but the system time will remain the same because the system clock isn't running.

The moral of the story is, to be on the safe side you need to set both the GEMDOS and the system time and date. The control panel desk accessory sets both clocks when you enter a time or date. If you just need elapsed time, then use the GEMDOS clock, it is always running whereas the system clock only runs if you set it.

You may or may not know that each file on the ST is time and date stamped. To view the time and date stamp of a file, use the view menu to switch to view as text. When you look at a disk in the text mode instead of the icon mode, you see the file name, the time and date stamp and the actual length of the file. The time and date stamp values come from the GEMDOS time, not from the system time.

The next calls I'd like to cover are the xbios calls: Physbase( ), Logbase( ), Getrez( ), and Setscreen( ). These calls are for manipulating the system's display. The Physbase( ) call returns a long value which is the address of the base of the screen display area. The screen display area is a block of 32000 bytes that is a buffer for the screen display.

Since the display on the ST is bit-mapped and the bit-mapping operations are performed by the 68000, we can move the display buffer around in memory. The Physbase( ) call returns the current display buffer base address. You will want to perform this call so that the display can be returned to normal prior to exit in any program that changes the display buffer.

The Logbase( ) call also returns a display buffer address, but this address is the "current pen location" or the address where the next graphic operation is to take place. You may be more comfortable with an X,Y coordinate system, but the address space of the 68000 is linear or one dimensional, so the ST maps the X,Y pair to a single address.

The Getrez( ) call returns an integer, 0 if the system is in low resolution, 1 for medium resolution and 2 for high resolution. This is a quick and easy way for application programs to check system resolution.

The Setscreen( ) call takes three parameters, the logical screen address or "current pen location," the display buffer base address and the resolution. This call allows you to switch the display buffer to another area of memory.

Before you get too excited over the dream of 10 or 15 displays flashing across the screen on your ST, I have bad news. The Setscreen( ) call will automatically clear the display buffer after each call. This is OK when you are switching to an area that you haven't written to yet, but when you try to switch back to an area you had left, so that the display is restored, the display is flashed on the screen for a split second, then it is erased! So much for easy multiple screens.

When you are in the text mode (.TOS application) the VT52 screen emulation is reset whenever you use the Setscreen( ) call. This means that you end up with a flashing cursor in the home position (upper left corner of the screen) and back to normal video (not inverse video) no matter what state you were in prior to the call to Setscreen( ).

There is another warning about the Setscreen( ) call, the display buffer base address must be boundry aligned in order for the display to be centered on the screen. Atari has claimed that the display buffer base address must be aligned on a 1024 byte border. This means that the address must be a multiple of 1024. I have found that all that is really required (for medium resolution displays anyway) is 256 byte alignment. The buffer must be at least 32000 bytes long to avoid problems.

This month we discussed the clocks maintained by the ST and the calls to manipulate them. The system maintains two clocks, the system clock and the GEMDOS clock. The GEMDOS clock is always running if the system is running, but the system clock will only start running once it has been set.

The GEMDOS clock supplies the time and date information for time and date stamping of the files. The time and date are encoded, and routines were provided to show extraction of this information.

The area of memory that the bit mapped display occupies can be manipulated with a series of xbios calls. The use of the Setscreen( ) call allows you to change the area of memory used as a display buffer, and change the resolution of the display, but if this call is used the system will automatically clear the display buffer a fraction of a second after the Setscreen( ) call. ●

### Home Accountant
continued from page 253

generated, the main display returns and hiccups a few times: by this I mean that the screen refreshes, clears, refreshes, clears then refreshes one last time, at a rate of about 2HX. It is annoying but over quickly and quite harmless.

You can get a report of your Income or Expenses by category or a combined Income/Expense Statement like your accountant makes up for you. You can even get a simple report of all your account's activities.

Home Accountant will also do some number crunching for you in the form of income and expense forcasts. Without this type of information, it would be impossible to establish reasonable budget guidelines. See Figure 3.

Most horrifying of all, Home Accountant will generate a Budget Comparison report. This will display what you budgeted and what you spent, in black and white. It will even calculate the difference between the two amounts.

Home Accountant comes with an order form for checks you can run through your printer, should you elect to let Home Accountant print the physical instruments for you. that could be very useful for people who write a lot of checks.

I really liked Home Accountant. The software is solid, and the human interface is cleanly implemented. The manual is clear and complete—it even includes an index. Home Accountant does all your home finances and then some. All of this sounds great. The catch? There is a lot of work involved, and a lot of duplication of effort. When you go to the supermarket, you must handwrite a check and make a physical check register entry. Then when you get a chance, you must repeat the entry in your soft check register entry. That sounds like more work than I am willing to do. The ability, to run off several checks on the first of the month and several more in the middle of the month sounds good too, but that means unloading paper, loading checks, running the software, unloading the checks and reloading the paper. Then you have to update your physical checkbook so when you are out shopping you'll know where you stand.

If you feel you're up to it, I would like to heartily recommend Home Accountant for your personal accounting needs.

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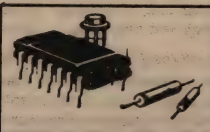
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**Expanding Your H/Z continued from page 125**

both CHASM and WASM, A86 is much easier to learn and use than MASM. All the SEGMENT declaring, register ASSUMEing, and other complicated nonsense required by MASM for even the smallest programs (but not really needed unless you're doing a huge assembly) can be avoided.

However, if you're trying to assemble a program that was originally written for MASM, and already has all those extra MASM pseudo-ops in it, there's a good chance that it can still be assembled successfully under A86! While not requiring the MASM pseudo-ops, A86 understands most of them (to a point), and knows how to deal with them (unlike CHASM and WASM). While not being absolutely 100% compatible with MASM, it's very close. A86 was designed to assemble as many MASM programs as possible without need for large re-writes.

Even more importantly, A86 has a long list of features that make it ideal for serious software development. For example, it can also pre-process individual files of a program separately, allowing for debugging of program modules. This makes modular programming much easier, and encourages the use of separately developed routine libraries.

In addition, A86 has one of the most powerful macro language facilities you've ever seen (Mr. Issacson maintains that they are much more powerful than MASM's or anybody else's). There's also a lot of neat built-in language extensions that make routine programming easier. And it has a huge capacity for label and macro storage, which are needed for large program development.

I think the language extensions deserve special mention here. Once you get onto them, they can be very handy. For example, unlike the older 8080 and Z-80 CPUs, the 8088/86 has no conditional return instuction available (like Return on Carry, etc.). Instead, you normally have to implement this type of instruction with a combination of instructions: JNC Label1 followed by a JMP Label2, etc. Anyway, A86 lets you optionally use a single mnemonic (like JC RET), and it will generate the needed code. What it all amounts to is a built-in set of custom macros that are always available. There are also several other nice extensions, including passing multiple registers to PUSH and POP, memory to memory MOVs, segment register to segment register MOVs, and more.

As if all features already mentioned weren't enough, A86 also supports all the language extensions of the Intel 188/186 and NEC V20/30 chips. Most of the 80286 instructions are there, too (except for the protected mode stuff). Unfortunately, the 8087/287 instructions, aren't present yet, but they and the protected mode 80286 instructions, are promised in the next version of A86 (due out by the time this is in print).

These are just some of the areas where the difference between A86 and other Shareware assemblers is obvious. While assemblers like CHASM and WASM are more than adequate for learning purposes or writing small programs, they just are not in the same class as A86 when it comes to serious software development.

### Kick in the A86 Assembler Afterburner!

One of the main advantages of A86, though, for extended software development, is the fact that it's FAST, FAST, FAST! The author maintains that it is the fastest Macro Assembler running under MS-DOS, bar none. It's certainly hard to prove him wrong. It reminds me of Turbo Pascal in the way it crunches source code. . . only it's even faster!

On my 7.37 Mhz V-20 powered system, with a hard disk, A86 took a 300 line source code file and created the final .COM, file, along with symbol table, in about 2.5 seconds! Reportedly, A86 running on an 8 Mhz AT with a hard disk assembles at about 1000 lines a

**continued on page 263**


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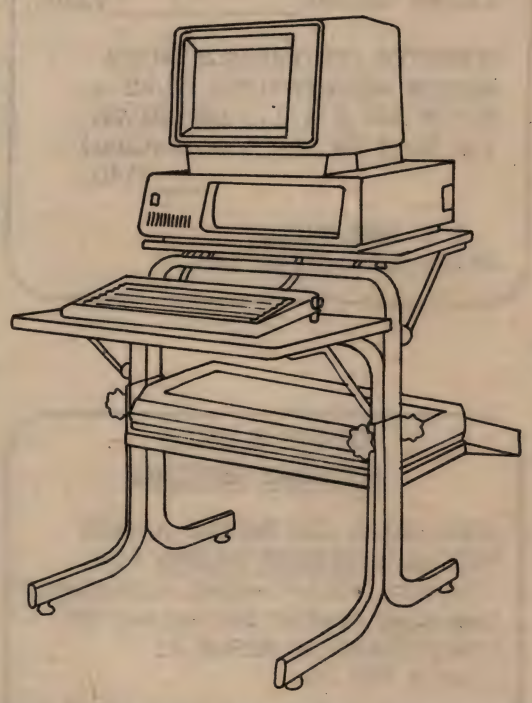

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**Contract Bridges continued from page 252**

ing them with the mouse. Sometimes you have to "scribble" over the selected card to get Bridge 4.0 to accept the input. After a trick is played, you click the mouse and the display is cleared and redrawn. This is slow at the beginning of the hand but not too bad near the end (fewer cards to draw).

At any time during the play you can Quit, Concede, or Claim the remaining tricks. Claim is a valuable feature: you can just claim the remaining tricks. If you have five cards left in your hand and they are the trump honors, there's no point in playing it out when the tricks are clearly yours. Likewise, if your opponent's dummy shows the five trump honors as his last five cards, you can save the play and concede the remaining tricks. I cautioned beginners against using Concede and Claim in haste. Playing one hand, before I discovered the Concede and Claim features, I had thought, "Oh, the rest of these are mine," but I played it out, not knowing then about Claim. Then I realized I had no way to lead into the Dummy's hand, where all the winning tricks were. We got set and I learned not to be too hasty. Obviously, if you know what you're doing this won't happen. At the end of the play the score pad is displayed in proper scorekeeping format.

The last display is elegantly designed. Three questions apply to the hand just played:

- would you like a display of all the hands
- would you like to replay the hand
- would you like to quit

Usually you can point your mouse at the NO box and select NO-NO-NO with mouse clicks in rapid succession. The display of all the hands should satisfy curiosity (I don't remember seeing the Queen of Spades). This option may also lend some insight as to the strategy opponents used.

You can be sure that you WILL want to replay a hand, from time to time. (If only I had saved that ace, I'd have had a path back to the dummy and could have played all those good tricks.) Not only will you replay the hand, you will rebid it. It will sooth your ego to go back and BID slam after you make slam on a bid of five diamonds.

Except for the fact that I have some trouble differentiating the suits in high resolution (I have to look closely), I have no complaints with this program. I can see that some design work went into this program to make it fun and easy to use. I especially liked the insight to include a way to "throw them in" when the outcome is inevitable.

I like this program very well, and I think beginners could really learn to play bridge with Bridge 4.0—learn by doing. ●


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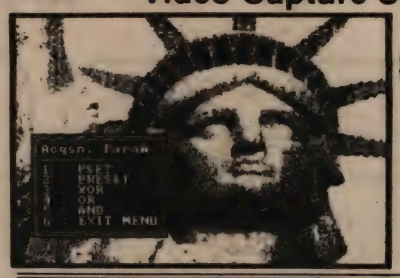

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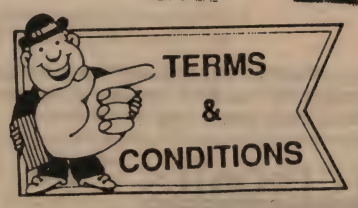


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**The Silver Box**
**continued from page 120**

it was supposed to.

Then why the environment module for Wordstar does not work and why that of Sidekick works for Wordstar? To resolve this question, we must know what the environment program modules do. So, I examined the modules and found that the so called environment modules are nothing but tables with listing of keys for editing function used by the program and a few important constants and settings. The modules are selected for each application program and determine which editing control keys should be used for editing functions necessary to replace the words and which modes and timing constant should be applied.

The program also watches the designated INS/OVW (INsert/OVerWrite) keys, or the mode sign on the top of the screen, to know the state of the screen. Regarding this setting, I had an unnerving experience. The default setting of the "Newword" is Insert mode and I did not change this. I found that Insert mode is more convenient for me than the other.

The temporary setback was the fact that, when I set Lightning for "start with Insert mode," it did not work. It must be set to "start with Overwrite mode" and the left arrow key must be specified for the back space key. Something was grossly wrong! I sat back and inhaled clean air coming from my 13 KV electro-static air filter with a powerul fan. When all the exhaust gases from factories and vehicles are coming this way, the air filter saves my lungs from total destruction.

I decided to use the maximum "piping delay" to watch the movement of the cursor. The maximum possible value is 999. If you use this value, the cursor moves about in 5 steps per second speed. I set the cursor on a bad word and checked the word. The Lightning came back with a list of "sound alike words." When I hit the <ENTER> key. The cursor visibly moved each step, wiped out the bad word and printed the corrected word! Then I remembered that back space requires movement of large character string while accessing the slow CRT controller many times. Consequently, the executing speed suffers and piping delay is necessary. Apparently, the factory setting for the Wordstar environment was too short for the V20 running at 7.3MHZ.

### More Tips On Installation

I assume you set the colors you want and pushed PF2 to save it. I assume you set the names and locations of the dictionaries. My setting is as below:

| | |
|---|---|
| RAM Dictionary | NUL |
| Auxiliary Dictionary | A:AUXI |
| Spelling Dictionary | E:HDISK |
| *Thesaurus* Dictionary | HTHES |

When you are in the main installation menu you should skip the Environment menu unless you want to choose the Environment for the dBASEIII or the ENABLE or other environments for your special applications. The environment setting can be better accomplished when you are running the word processor than going through the main installation menu. So, you forget it now.

The next in the menu is the "Hot Keys" installation. Select this item and install <CTRL> >SHIFT> + "0" for the top line by pushing all three keys together. The second line should be <CTRL> <SHIFT> + "9" and so forth down the line, until you reach the key "4." Then, as for other items push the <ESC> to exit this item.

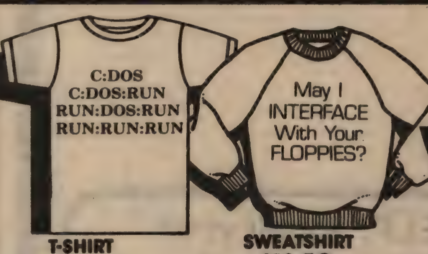
The next item in the installation menu is beep. You skip it. You cannot use it. Now, you type "X" to save and exit the installation program. Assuming you did not load the Lightning already, type [LIGHT]. If the program finds all the dictionary files at the designated locations, it will display a log-in message window similar to Sidekick. If you come to see it, the program is now resident and if you push <CTRL> <SHIFT> + "0," all three keys together, you will see the Main Menu. If you got it, you are halfway through the installation. Now get out of it by pushing the <ESC> and load Wordstar. Load a DOC file and start editing. Then open the Main Menu from the editing screen by pushing <CTRL> <SHIFT> + "0." When you got the Main Menu, the selection is "Environment." You hit the <ENTER> to get the Environment Menu.

Select Wordstar by hitting <ENTER>, after this selection is made, hit <PF2> to get the Environment table. Since you are in Wordstar, do not select "Change name." Rather, type "N." This will get you to select the "Piping delay." Type "030" to set the delay if you are using speed board with the V20. If not, use "015." Next is setting the screen mode. Type "P" to get the mode set menu, and type "E." Move the cursor to right. When the cursor gets to the "I," the first character of the word "Insert." Hit the <ENTER> key. It asks you if the mode is insert or overwrite. You hit "I." Type two <ESC> to get back to Main menu and type "S."

When you see the "Setup" menu, type "D" to save it. To use the new LIGHTNING.COM you have just installed, you must get out of the word processor and remove the resident LIGHT first. When you are out of the word processing program, get the Main menu and type <HOME> and then <END> while pushing the <CTRL> key. The prompt blinks and you are ready to reload the LIGHT.

Final test is to correct the "last bad word." Go back to the editing mode in the Wordstar, type "teist of the last bad word." Then, push all three keys together, <CTRL>

**continued on page 263**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| Z80ACTC | .95 | 8877A | .95 | | | | |
| Z80CTC | .75 | 9827 | .95 | | | | |
| 8088-2 | 3.95 | 9637 | .95 | | | | |

* Used in IBM Clone

**RAMS**

| | | | |
|---|---|---|---|
| 16K - Dynamic—200ns | .39 | 16K - Static—200ns | 1.25 |
| 16K - Dynamic—150ns | .55 | 16K - Static—300ns | .95 |
| 64K - Dynamic—200ns | 1.15 | 64K - Dynamic—150ns | 1.25 |
| 256K - Dynamic—150ns | 3.35 | 2114 Type - Static | .69 |

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| 20 | ICS-20 | .105 |
| 22 | ICS-22 | .12 |
| 24 | ICS-24 | .125 |
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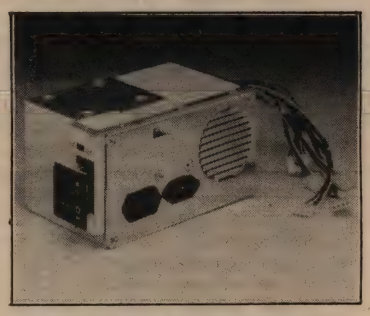

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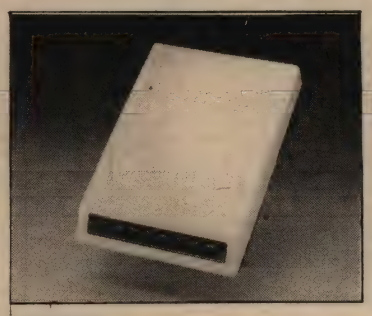

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## "Inner Limits" Modified "Charal" Character Sets

CTRLCHAR and PUNCT-D are shared by both the TI font and the Apple font.

```
CTRLCHAR

        DEF SFIRST,SLAST,SLOAD
*                                       ASCII

SFIRST
SLOAD   DATA >0020,>0000,>1824,>2418    0
        DATA >0020,>0008,>1808,>081C    1
        DATA >0020,>0018,>2408,>103C    2
        DATA >0020,>0018,>2408,>2418    3
        DATA >0020,>0014,>141C,>0404    4
        DATA >0020,>001C,>1018,>0418    5
        DATA >0020,>0008,>1038,>2418    6
        DATA >0020,>001C,>0408,>1010    7
        DATA >0020,>0018,>2418,>2418    8
        DATA >0020,>0018,>241C,>0408    9
        DATA >2020,>3800,>1C10,>1C10    A
        DATA >0040,>0020,>2038,>2438    B
        DATA >0070,>5070,>4854,>1C14    C
        DATA >0070,>4070,>001C,>1010    D
        DATA >0020,>0018,>243C,>2018    E
        DATA >0040,>0814,>101C,>1010    F
        DATA >0040,>4040,>1824,>2418    10
        DATA >0020,>2020,>2808,>0808    11
        DATA >0040,>4058,>2408,>103C    12
        DATA >0040,>4058,>2408,>2418    13
        DATA >0040,>4054,>141C,>0404    14
        DATA >0040,>405C,>1018,>0418    15
        DATA >0040,>4048,>1038,>2418    16
        DATA >0040,>405C,>0408,>1010    17
        DATA >0040,>4058,>2418,>2418    18
        DATA >0040,>4058,>241C,>0408    19
        DATA >0040,>4040,>1824,>3C24    1A
        DATA >0040,>4050,>101C,>141C    1B
        DATA >0040,>4040,>1C10,>101C    1C
        DATA >0040,>4444,>041C,>141C    1D
        DATA >0070,>7070,>7070,>7070    1E
        DATA >0040,>4C50,>101C,>1010    1F


PUNCT-D

        DATA >0018,>2020,>4020,>2018    {
        DATA >0010,>1010,>0010,>1010    |
        DATA >0030,>0808,>0408,>0830    }
        DATA >0000,>2054,>0800,>0000    ~

SLAST   END


CHARA1/S  (copies for TI font)

        COPY "DSK1.CTRLCHAR"
        COPY "DSK1.PUNCT-A1"
        COPY "DSK1.DIGITS-1"
        COPY "DSK1.PUNCT-B1"
        COPY "DSK1.UCASE-1"
        COPY "DSK1.PUNCT-C1"
        COPY "DSK1.LCASE-1"
        COPY "DSK1.PUNCT-D"


PUNCT-A1

        DATA >0000,>0000,>0000,>0000    (SPACE)
        DATA >0010,>1010,>1000,>1000    !
        DATA >0028,>2828,>0000,>0000    "
        DATA >0028,>7C28,>287C,>2800    #
        DATA >0038,>5430,>1854,>3800    $
        DATA >0044,>4C18,>3064,>4400    %
        DATA >0020,>5020,>5448,>3400    &
        DATA >0008,>1020,>0000,>0000    '
        DATA >0008,>1010,>1010,>0800    (
        DATA >0020,>1010,>1010,>2000    )
        DATA >0028,>107C,>1028,>0000    *
        DATA >0010,>107C,>1010,>0000    +
        DATA >0000,>0000,>0030,>1020    ,
        DATA >0000,>007C,>0000,>0000    -
        DATA >0000,>0000,>0030,>3000    .
        DATA >0004,>0810,>2040,>0000    /


DIGITS-1

        DATA >0038,>4C54,>5464,>3800    0
        DATA >0010,>3010,>1010,>3800    1
        DATA >0038,>4408,>1020,>7C00    2
        DATA >007C,>0418,>0444,>3800    3
        DATA >0018,>2848,>7C08,>0800    4
        DATA >007C,>4078,>0444,>3800    5
        DATA >0038,>4078,>4444,>3800    6
        DATA >007C,>0408,>1020,>2000    7
        DATA >0038,>4438,>4444,>3800    8
        DATA >0038,>4444,>3C04,>3800    9


PUNCT-B1

        DATA >0000,>3030,>0030,>3000    :
        DATA >0000,>3030,>0030,>1020    ;
        DATA >0000,>1020,>4020,>1000    <
        DATA >0000,>007C,>007C,>0000    =
        DATA >0000,>1008,>0408,>1000    >
        DATA >0038,>4408,>1000,>1000    ?
        DATA >0038,>4454,>5840,>3C00    @


UCASE-1

        DATA >0038,>447C,>4444,>4400    A
        DATA >0078,>2438,>2424,>7800    B
        DATA >0038,>4440,>4044,>3800    C
        DATA >0078,>2424,>2424,>7800    D
        DATA >007C,>4078,>4040,>7C00    E
        DATA >007C,>4078,>4040,>4000    F
        DATA >003C,>405C,>4444,>3800    G
        DATA >0044,>447C,>4444,>4400    H
        DATA >0038,>1010,>1010,>3800    I
        DATA >0004,>0404,>0444,>3800    J
        DATA >0048,>5060,>5048,>4400    K
        DATA >0040,>4040,>4040,>7C00    L
        DATA >0044,>6C54,>5444,>4400    M
        DATA >0044,>6454,>4C44,>4400    N
        DATA >0038,>4444,>4444,>3800    O
        DATA >0078,>4478,>4040,>4000    P
        DATA >0038,>4444,>5448,>3400    Q
        DATA >0078,>4478,>5048,>4400    R
        DATA >003C,>4038,>0404,>7800    S
        DATA >007C,>1010,>1010,>1000    T
        DATA >0044,>4444,>4444,>3800    U
        DATA >0044,>4428,>2810,>1000    V
        DATA >0044,>4454,>5454,>2800    W
        DATA >0044,>2810,>2844,>4400    X
        DATA >0044,>2810,>1010,>1000    Y
        DATA >007C,>0810,>2040,>7C00    Z


PUNCT-C1

        DATA >0038,>2020,>2020,>3800    [
        DATA >0000,>4020,>1008,>0400    \
        DATA >0038,>0808,>0808,>3800    ]
        DATA >0010,>386C,>4400,>0000
        DATA >0000,>0000,>0000,>7C00    _
        DATA >0020,>1008,>0000,>0000    `


LCASE-1

        DATA >0000,>0038,>4848,>3C00    a
        DATA >0020,>2038,>2424,>3800    b
        DATA >0000,>001C,>2020,>1C00    c
        DATA >0004,>041C,>2424,>1C00    d
        DATA >0000,>001C,>2830,>1C00    e
        DATA >000C,>1038,>1010,>1000    f
        DATA >0000,>001C,>241C,>0438    g
        DATA >0020,>2038,>2424,>2400    h
        DATA >0010,>0030,>1010,>3800    i
        DATA >0008,>0008,>0808,>4830    j
        DATA >0020,>2024,>3828,>2400    k
        DATA >0030,>1010,>1010,>3800    l
        DATA >0000,>0078,>5454,>5400    m
        DATA >0000,>0038,>2424,>2400    n
        DATA >0000,>0018,>2424,>1800    o
        DATA >0000,>0038,>2438,>2020    p
        DATA >0000,>001C,>241C,>0404    q
        DATA >0000,>0028,>3420,>2000    r
        DATA >0000,>001C,>300C,>3800    s
        DATA >0010,>1038,>1010,>0C00    t
        DATA >0000,>0024,>2424,>1C00    u
        DATA >0000,>0044,>2828,>1000    v
        DATA >0000,>0044,>5454,>2800    w
        DATA >0000,>0024,>1818,>2400    x
        DATA >0000,>0024,>241C,>0438    y
        DATA >0000,>003C,>0810,>3C00    z


CHARA2/S  (copies for Apple font)

        COPY "DSK1.CTRLCHAR"
        COPY "DSK1.PUNCT-A2"
        COPY "DSK1.DIGITS-2"
        COPY "DSK1.PUNCT-B2"
        COPY "DSK1.UCASE-2"
        COPY "DSK1.PUNCT-C2"
        COPY "DSK1.LCASE-2"
        COPY "DSK1.PUNCT-D"


PUNCT-A2

        DATA >0000,>0000,>0000,>0000    (SPACE)
        DATA >0010,>1010,>1000,>1000    !
        DATA >0028,>2828,>0000,>0000    "
        DATA >0028,>7C28,>287C,>2800    #
        DATA >0038,>5430,>1854,>3800    $
        DATA >0044,>4C18,>3064,>4400    %
        DATA >0020,>5020,>5448,>3400    &
        DATA >0008,>1020,>0000,>0000    '
        DATA >0008,>1010,>1010,>0800    (
        DATA >0020,>1010,>1010,>2000    )
        DATA >0028,>107C,>1028,>0000    *
        DATA >0010,>107C,>1010,>0000    +
        DATA >0000,>0000,>0030,>1020    ,
        DATA >0000,>007C,>0000,>0000    -
        DATA >0000,>0000,>0030,>3000    .
        DATA >0004,>0810,>2040,>0000    /


DIGITS-2

        DATA >384C,>4454,>4464,>3800    0
        DATA >1030,>1010,>1010,>3800    1
        DATA >3844,>0408,>1020,>7C00    2
        DATA >3844,>0418,>0444,>3800    3
        DATA >0818,>2848,>7C08,>0800    4
        DATA >7C40,>7804,>0444,>3800    5
        DATA >1820,>4078,>4444,>3800    6
        DATA >7C04,>0810,>2020,>2000    7
        DATA >3844,>4438,>4444,>3800    8
        DATA >3844,>443C,>0408,>3000    9


PUNCT-B2

        DATA >0000,>3030,>0030,>3000    :
        DATA >0000,>3030,>0030,>1020    ;
        DATA >0000,>1830,>6030,>1800    <
        DATA >0000,>007C,>007C,>0000    =
        DATA >0000,>3018,>0C18,>3000    >
        DATA >3844,>0408,>1000,>1000    ?
        DATA >0038,>4454,>5840,>3C00    @


UCASE-2

        DATA >3844,>447C,>4444,>4400    A
        DATA >7824,>2438,>2424,>7800    B
        DATA >3844,>4040,>4044,>3800    C
        DATA >7824,>2424,>2424,>7800    D
        DATA >7C40,>4078,>4040,>7C00    E
        DATA >7C40,>4078,>4040,>4000    F
        DATA >3C40,>405C,>4444,>3800    G
        DATA >4444,>447C,>4444,>4400    H
        DATA >3810,>1010,>1010,>3800    I
        DATA >1C04,>0404,>0444,>3800    J
        DATA >4448,>5060,>5048,>4400    K
        DATA >4040,>4040,>4040,>7C00    L
        DATA >446C,>5454,>4444,>4400    M
        DATA >4464,>6454,>4C44,>4400    N
        DATA >3844,>4444,>4444,>3800    O
        DATA >7844,>4478,>4040,>4000    P
        DATA >3844,>4444,>5448,>3400    Q
        DATA >7844,>4478,>5048,>4400    R
        DATA >3844,>2010,>0844,>3800    S
        DATA >7C10,>1010,>1010,>1000    T
        DATA >4444,>4444,>4444,>3800    U
        DATA >4444,>4428,>2810,>1000    V
        DATA >4444,>4454,>5454,>2800    W
        DATA >4444,>2810,>2844,>4400    X
        DATA >4444,>2810,>1010,>1000    Y
        DATA >7C04,>0810,>2040,>7C00    Z


PUNCT-C2

        DATA >3820,>2020,>2020,>3800    [
        DATA >0000,>4020,>1008,>0400    \
        DATA >3808,>0808,>0808,>3800    ]
        DATA >0010,>386C,>4400,>0000
        DATA >0000,>0000,>0000,>7C00    _
        DATA >0020,>1008,>0000,>0000    `


LCASE-2

        DATA >0000,>3804,>3C44,>3C00    a
        DATA >4040,>7844,>4444,>7800    b
        DATA >0000,>3C40,>4040,>3C00    c
        DATA >0404,>3C44,>4444,>3C00    d
        DATA >0000,>3844,>7C40,>3C00    e
        DATA >1824,>2078,>2020,>2000    f
        DATA >0000,>3844,>443C,>0438    g
        DATA >4040,>7844,>4444,>4400    h
        DATA >1000,>3010,>1010,>3800    i
        DATA >0800,>1808,>0808,>4830    j
        DATA >4040,>4448,>7048,>4400    k
        DATA >6020,>2020,>2020,>7000    l
        DATA >0000,>6C54,>5454,>4400    m
        DATA >0000,>7844,>4444,>4400    n
        DATA >0000,>3844,>4444,>3800    o
        DATA >0000,>7844,>4478,>4040    p
        DATA >0000,>3844,>443C,>0404    q
        DATA >0000,>5C60,>4040,>4000    r
        DATA >0000,>3C40,>3804,>7800    s
        DATA >2020,>7820,>2024,>1800    t
        DATA >0000,>4444,>444C,>3400    u
        DATA >0000,>4444,>4428,>1000    v
        DATA >0000,>4444,>5454,>6C00    w
        DATA >0000,>4428,>1028,>4400    x
        DATA >0000,>4444,>443C,>0438    y
        DATA >0000,>7C08,>1020,>7C00    z
```

**The TI Forum continued from page 124**

GOTO. I hope you can follow this.

[3] We could have used a function similar to CALL KEY (O,E,F) as in line 270. But, by using "getchar()" we accomplish the same thing in one line. Getchar waits for a keypress automatically without testing for "status."

[4] FOR-NEXT loops in c99 are three parts. Just as

```
240 FOR D=2 TO 14
250 CALL COLOR(D,D,C)
260 NEXT D
```

accomplishes three things (set D=2, than CALL COLOR (D,D,C), then increment D by one, then loop), the FOR loop in c99 does it all on one line. We say

```
for(d=1;d<=14;d++);
```

d is set to a, then tested to see if it is less than or equal to 14. The color(d,d,c) is executed as log as d<=14. As each color() function is executed, d is incremented by one by the "d++" statement. All things are done with one statement. Also remember that there are multiple commands after a FOR statement in c99, they must be set off between a pair of braces. If a single statement, as we have here, they can be used without the braces.

I hope this aids you in understanding c99. If you have questions, just ask. And if you want a reply, send a self-addressed stamped envelope.

### Jonathan's News

#### BCS Offers TI-Writer Tips & Tricks

Joyce Corker and J. Peter Hoddie of the Boston Computer Society are offering an excellent TI-Writer Tips and Tricks guide for $5.00 plus $1.00 shipping.

The guide is a helpful refresher for those who are familiar with TI-Writer but haven't looked at the manual recently, and even contains a few tips not found in the manual.

For more information or to order the guide, contact the Boston Computer Society, TI-99/4A User Group, One Center Plaza, Boston, MA 02108.

#### Pre-Scan It! Another Great Programmer's Aid

Also from Peter Hoddie of the BCS and distributed through Asgard Software is Pre-Scan It!, an Extended BASIC utility designed to cut down on the initial XBASIC program starting time through use of the prescan commands.

TI Extended BASIC version 110 (virtually all TI XBASIC modules now in use) includes prescan commands for use by programmers. The idea is to be able to toggle the initial prescanning of a program, which is what takes up so much time between the issuing of the RUN command and the actual execution of the program.

"!@P-" will turn off prescan, "!@P+" will turn it

**continued on page 268**

**The Inner Limits continued from page 123**

and/or Chara-AP files. Then rename one of them (the one you want to use) to Chara1, which TI-Writer will be able to load. Put this file on the same disk as the TI-Writer program files are on. TI-Writer will automatically load it.

In the file listings, the filename precedes the file in bold print. Type in that file and save it under the suggested name. **Do not enter the name into the file itself!** Purge memory and start on the next one. Given that most people do make typographical errors, using small files like this makes it easy to find errors, which will be evident because the characters will not look right.

That's it for this month. If you have any questions on these fonts, please write me care of *Computer Shopper*. I'd appreciate letters from people that have developed foreign characters for both of these fonts. THE INNER LIMITS. ●


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| TOSHIBA 351C | $1224 |
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| CITIZEN MSP-10 | $279 |
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| AMDEK 730 | $715 |
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| TAXAN 122 | $139 |
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**Multiple Column**
**continued from page 126**

large for the memory, it will be necessary to read the text file several times, each time processing and printing different portions of the file. Another way to do this is to write a portion of the text to a temporary disk file and then read it back as space in the array becomes available.

Spaces for pictures can be left in the printed text by adding temporary routines. For example, lines 24 thru 36 in the left hand column of page three can be left blank.

Another useful modification could allow the title on the first page to be printed all the way across the page in expanded type.

Selective printing is also possible so that two or more different lists may be printed from the same text file. This is accomplished by the addition of a recognition character at the start of each line. This way one complete disk file can be used to produce two different printouts. For example, a bargain hunter could be sent only a list of the cheaper items while a more serious customer would get the entire list.

The greatest advantage of compiling this program is the reduced size of the executable code which would allow the array to hold more text at one time. This is worth more than the faster execution of the compiled code.

Another useful change is the addition of a multiple copy feature with the addition of another INPUT statement to prompt the operator for the number of copies. A separate file of personalized messages could be read so that each printed copy would be different. Of course, the addition of a short routine could allow the printing of your address and a customer's address on an envelope after each copy is printed. It would be useful to print an "INSERT ENVELOPE IN PRINTER" message on the screen.

Here is the source code for an ambitious modification that produces three small booklets from a single sheet of typing paper (8.5 by 11 inches), which is printed on both sides and then cut, folded and stapled. Each booklet measures about two by three inches (the size of a business card) and has eight pages. The booklets are used instead of business cards by several local retail stores because the additional space allows a much more comprehensive description to be included concerning the varieties of products and services of each operation. Another advantage is that the text can be revised as often as desired. Several trial printings of unique slogans in the booklets resulted in products that were good enough to sell for a quarter each. When used with a system having a color printer, the addition of colorful artwork on the covers would produce a more attractive booklet. This could be done with the addition of a routine to read graphic files and send the correct codes to the printer mixed with the text. An easier way is to use a hand stamp and an inkpad (red or green ink) to decorate the covers.

The program presented is configured for single sheet paper printed on both sides. The Okidata 82A doesn't print all the way to the bottom of single sheet paper and this limits the page length of each of the three booklets to twenty lines each (not counting the line with the page numbers and two blank lines between each two adjacent copies on the page). Alignment between the text on each side of the paper is critical in order to prevent folds and cuts from mutilating part of the text. If this becomes a problem, use a shorter page line length and wider spaces between columns (28 characters per line, not counting the carriage return works satisfactorily). This program is usually used with a text file of 160 lines. Two lines of the cover (page 1) are used for the title and eighteen lines are left blank. Sometimes the back cover is used for text but often it is filled with twenty blank lines.

See Figure 2

Line 15 establishes the values of three variables used for positioning the three rightmost of the four columns of text. Changes are easier to make with the use of this short line instead of editing lines 145 and 190.

Line 145 prints one line of pages 6, 3, 8 and 1; while line 190 prints one line of pages 2, 7, 4 and 5.

Lines 162 and 212 print page numbers. It is easy to omit the page numbers from the covers to prevent their interference with artwork.

Lines 170 and 220 count the number of complete page sets printed on the currently printed side of the paper. Lines 125 and 185 reset this value.

Line 230 provides an opportunity to print three more booklets on another sheet of paper.

Other modifications of the program are possible and are limited only by the imagination of experimenters and the capability of the hardware used. Of course, other languages (Pascal, Forth etc.) can be used with the same design concepts presented here. Special modifications to the double column program are available from the author for a competitive price by writing Double Column Headquarters, 3148 Holmes Ave. So., Minneapolis MN 55408. ●

```
10 LPRINT CHR$(29),CHR$(27)+"8"
15 X=34:Y=69:Z=104
20 INPUT"LINES PER PAGE";A
30 DIM B$(A*8)
40 INPUT"FILE NAME";A$
50 OPEN"I",#1,A$
70 LINE INPUT#1,C$
80 B=B+1
110 B$(B)=C$
120 IF B=(A*8) THEN 130 ELSE 60
125 D=0
130 C=C+1
145 LPRINT B$((5*A)+C);TAB(X);B$((2*A)+C);
    TAB(Y);B$((7*A)+C);TAB(Z);B$(C)
150 IF C=A THEN 160 ELSE 130
160 B=0: C=0
162 LPRINT"6";TAB(Y-7);"3        8";TAB(131);"1"
165 LPRINT: LPRINT
170 D=D+1: IF D=3 THEN 180 ELSE 130
180 INPUT"Ready for other side (Y or N)";F$
181 IF ASC(F$)=89 OR 121 THEN 185
185 D=0
186 C=C+1
190 LPRINT B$(A+C);TAB(X);B$((6*A)+C);
    TAB(Y);B$((3*A)+C);TAB(Z);B$((4*A)+C)
200 IF C=A THEN 210 ELSE 186
210 B=0:C=0
212 LPRINT "2";TAB(Y-7);"7        4";TAB(131);"5"
215 LPRINT:LPRINT
220 D=D+1: IF D=3 THEN 230 ELSE 186
230 INPUT"More (Y or N)";F$
240 IF ASC(F$)=89 OR 121 THEN 125 ELSE STOP
```

Figure 2


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**Survivors of Clone**
**continued from page 125**

dividuals who maintain an attitude of independence about their products.

David A. Brockman
FBE Research Company, Inc.
P.O. Box 68234
Seattle, WA 98168

Dave is an 18-year veteran of Boeing Aircraft, where he designed navigational systems and digital equipment. He helped to introduce the H-89 to Boeing so that he and other engineers didn't have to wait their turn with time-sharing on the company's mainframe.

When the first Epson MX-80's came available and Dave's H-89 didn't have a parallel interface to drive it, he tore into the printer and built his own. It worked so well that all his friends at Boeing wanted one. By 1981, word within the close-knit Heath/Zenith network of User Groups, brought him a deluge of requests for copies of the parallel interface.

During the next three years, he produced a rash of add-on boards of the H-89, including the H89CTI parallel-printer interface, the H89UTI, a multi-function I/O card that also added a non-volatile system clock and a math co-processor, and a RAM expansion board. In 1984, he created SPOOLDISK 89, a silent disk/printer spooler card with 128K RAM, that allowed the user to reset his system while the spooler toiled away on its own.

SLOT 4 created an additional inexpensive expansion slot for the '89s right-side bus. SPOOLDISK 89 and SLOT 4 are still selling well, even though the bulk of FBE's business is for the Z-100 and Z-150 series of computers.

Early in 1985, when Zenith

**continued on page 264**


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**Expanding Your H/Z continued from page 255**

second. (Some assemblers would be fortunate to assemble 1000 lines a minute under similar circumstances.)

### A User Friendly Macro Assembler?

There's one other really outstanding feature that's unique to A86. When assembling a source file and finding an error, it doesn't just report some cryptic error message on the screen and then a line number where the error occurred (like some assemblers do). Instead, it makes a copy of your source code file and inserts a user-friendly, full English error message into it at the point of the error (it backs up your original source file by renaming it as an .OLD file). You can then enter your favorite text editor, and easily find the errors right in the text where they occurred. Since, A86 puts a tilde (~)in front of each error it finds, along with the error message, you can simply use your editor's Search option to find all errors, by looking for all the tildes in the text.

When correcting errors in the source text, you don't even need to edit out the old error message. Just make the needed corrections to the assembler code, and run it back through A86. The next time through, if A86 finds that the error has been corrected, it automatically takes out the old error message (and tildes)! When you've got the source code assembling properly, it will automatically come out clean (with no error messages).

While this all may sound a little cumbersome at first, it really speeds up the development process quite a bit, when you get onto it. In fact, after a while, it's reminiscent of Turbo Pascal's compile time error messages. Although you aren't automatically thrown back into an edit mode when the errors occur, it is still much better than trying to correlate line numbers with error messages, as other assemblers require.

### D86—A Full Screen Assembler Debug Tool

Another real plus for A86 is the fact that Eric has also developed a full-screen source level debugger for it, called D86. Currently, Eric is making D86 a separate module from A86, and asks that you donate an additional $40 for it. (You can read my comments on this policy in my summary section.) D86 is light years ahead of the DOS-supplied DEBUG Program for debugging A86 assembler code.

When A86 assembles a file, it creates a symbol file that contains the names and addresses of all symbols in the program (labels, variable names, etc.). D86 then takes the output .COM file, adds it together with the symbol table, and re-creates a full screen display showing all the CPU registers, several lines of memory dump (you specify the format of the dump), and a complete source code listing (minus the comments).

You can then single step through the source code, one line at a time, and see the effect it has on the various CPU registers, memory locations, etc. You can even type in assembly language statements, one at a time, or set multiple breakpoints for the trace. Even if you are debugging a .COM file that doesn't have a symbol table, you can create one as you go. You can also patch memory, write additional assembler code, and see the runtime contents of the stack on screen.

This interactive capability of D86 makes it perfectly suited for using the A86/D86 package as an 8088/86 assembly language learning tool. There are a lot of other features in D86 that are too numerous to mention here, but it is a very nice complement to A86. (Consciously or not, Eric has created a package that is going to probably be very popular with assembly language instructors!)

While A86 is written to run on any DOS compatible computer (even including machines like the Sanyo 555, H/Z-100, and Tandy 2000), D86 doesn't (yet). It makes direct BIOS calls that must be IBM compatible. But, the author has made it clear he wants to get it working on all machines, if possible. So, if D86 doesn't yet work on your system, you can correspond with him about what it will take to get it working for you (are you listening H/Z-100 users???)

### Yes, Folks, There are Some Limitations

While A86 is obviously a powerful assembler, and it does have some minor limitations (just in case you didn't think it had any). First of all, A86 directly creates .COM files during assembly, speeding up development time for small to medium sized programs. But since it directly creates .COM files, the code portion of the assembled program is limited to 64K. Also, without .OBJ files, you can't easily link the assembled output together with other assembled files. But, Eric Issacson has promised to address both of these limitations in an upcoming version of A86. (By the way, registered A86 users are entitled to unlimited future updates to any new versions for only a $10 disk copy fee.)

Another, more significant problem, is that the documentation provided with A86 (which are a series of text files on disk) is adequate for simple familiarization but is not really sufficient for extended references or as a tutorial. There is no page numbering, index, or table of contents. After you get done printing all the documentation files out, you basically just have a stack of paper that you have to sort through all the time when looking up a topic. Also, even when you register the program, don't expect a printed manual for A86. There isn't one. The disk files are it (for now).

As I've mentioned before, the A86/D86 package is perfectly suited for assembly language instruction. But, without an adequate text to accompany the programs, it has some serious limitations along those lines. Perhaps, if A86 catches on, we'll see some good books about it, or Eric will make some available for extra cost.

### Summary

Both A86 and D86 are very well done. The ease of use, many additional features, and the basic performance of the package is very good. For assembler programs that produce object code smaller than 64K (the current limit for A86), I don't think you can find an equal at any price, let alone $40.

The few reservations that I do have about A86/D86 relate to its peripheral problems. First, the documentation is inadequate for beginning users (and anyone who needs quick access to the information). Since those who are just starting to learn 8088/86 assembler

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**The Silver Box continued from page 258**

<SHIFT> + "9." In a blink or two, you'll see a table of "Words sound alike." You then select any word by typing the item alphabet, or by moving the bar with the arrow keys, and select a word hitting the <ENTER> key. You should see the cursor scurries to the bad word and corrects it if you were in the Auto-Proof mode when you typed the sentence correctly as shown. If you typed second bad word, the first bad word will be forgotten.

### The Release 1A Patch

It is well known by some people that the Sanyo video board, VB512, comes with a Sanyo DOS which will not run Lotus 1-2-3. I have a DOS with IO Version 2.04. This DOS seems to run it. I do not use Lotus 1-2-3 at this time, so it was not my immediate concern but I saw a very interesting article in the September 1986 *SNUG* newsletter. In the article, Bob Jack explains how to patch the Release 1A to make it run. It is very well written and shows you what is involved. The question is where to buy the now obsolete Release 1A. Does anyone have another patch to run the Release 2?

If you are interested contact Mike Russell, Box 3445, Moscow, ID 83843, (CIS:72257,3701). I was told that *SNUG* has no phone.

### More Items Are Being Planned For Next Month

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**Survivors continued from page 262**

licensed his ZCLK board for the Z-100 and became the exclusive distributor, Dave quit Boeing and set up shop on a full-time basis. In rapid succession he produced ZMF100, a plug-in modification to the motherboard allowed early Z-100's to use 256K RAM chips.

With MegaRAM-150, he replaced Zenith's memory decoder PAL chip for the Z-150/160 so that all the 74K RAM chips were replaced by 256K devices for a total of 1216K system RAM, 512K of which could be used as a memory disk device. Most recently, there's COM3, which adds a third serial port to Zenith's IBM compatibles, and clock boards for the Z-138 and Z-148 computers.

FBE's trademark (except for the $199 SPOOLDISK 89) has been to provide simple to install and useful hardware modifications under $100. They're the kind of things Dave Brockman would like to have if he wasn't doing it himself. All of FBE's documentation and support software earn high marks and the technical assistance the firm provides may well be among the best of any H/Z vendor.

His clock designs, in particular, have achieved a wide reputation, and one was recently licensed for the DEC Rainbow with a first-year production run of 30,000 units.

Brad & Kay Gjerding
Magnolia Microsystems, Inc.
4039—21st Avenue West
Seattle, WA 98199

Magnolia is now in its second decade of operation, predating even Heath and Zenith Data systems. They were one of Seattle's first independent retail computer and consulting firms, and have since become one of the leading firms in the area.

They became a Heath/Zenith distributor in 1979. But since H/Z was slow to adapt its computers to the business market, Brad Gjerding set out to correct some of the '89s early hardware and software deficiencies. He obtained a license from Digital Research to implement a CP/M BIOS for the '89, a full year before Zenith produced theirs. Magnolia was also first in manufacturing a variety of hard disk interface cards that allowed use of the most popular hard disk drive systems. Their 7720 SASI interface is still one of the most widely distributed host adaptor cards for the '89.

Although it was designed to operate with their own implementation of CP/M, Quikdata, Inc. (2618 Penn Circle, Sheboygan, WI 53081) uses this card along with their own hard disk software that supports standard H/Z CP/M and the older HDOS operating system.

Other Magnolia products include a 128K RAM card, a double-density disk controller (both of which include CP/M+), a RAM expansion card and a module that would allow the '89s CRT output to be projected on a large screen monitor.

Although Magnolia hasn't produced any new enhancements other than an interesting computer networking system for the H-89, the Z-100 and the IBM system, all of their early boards are kept in stock to satisfy the demands of their customers and dealers.

Magnolia products are sold primarily through dealers, who are responsible for technical support, which is hard to obtain directly from Magnolia. They're also close-minded about releasing schematics or technical information about their products. Their products incorporate unique features not always available from competing firms, but they require a sophisticated user well-versed in the operation of his system.

Clay D. Montgomery
SigmaSoft & System
17000 Dallas Parkway #207
Dallas, TX 75248

Clay Montgomery started his firm in 1981, when he was still in high school and worked part-time at the Dallas Heath/Zenith Electronic Center.

His first product was a music board for the '89. In 1983 he designed the Universal Parallel Interface that would in recent years become an interface for some powerful expansion products. While pursuing a degree in computer science, he became interested in graphics and started toying with a language of his own that could draw graphic images not only through high-level languages, but could be implemented through a simple text editor by people who either had little or no programming experience.

He became so engrossed in his quest that college began to bore him. He had taught himself programming and circuit designing and decided to use his knowledge to design a graphic board for the '89. It was released in the fall of 1984 as the Interactive Graphics Controller. It mated to the computer's Terminal Logic Board through DIP plugs and to his Universal Parallel Interface to the CPU board. Because of its size, it had to mount over the CRT.

It contained its own 256K RAM working area that could be allocated into separate banks and was capable of creating interlaced mode graphic designs as fine as 640x500 pixel resolution. Other firms have tried their hand at graphic boards for the '89, and while their design technology may have been more sophisticated than SigmaSoft's offering, their prices were exorbitant, and they had no software to speak of.

Recent modifications include an expanded graphics library, print spooling and RAM disk software.

Early in 1986, the SigmaSoft Disk System arrived. By adding a second port to the Universal Parallel Interface, and using the Western Digital WD1002-5 floppy/hard disk controller, Clay offered a very cost effective disk system that emulated Zenith's own double-density floppy controller and allowed the use of high-storage hard disk media such as the Maxtor 67-MB drives.

SigmaSoft's recent move to larger offices hints of new products not only for the '89, but for the Z-100 and Z-150 computers.

Herm & Marc Brooks
Controlled Data Recording Systems, Inc.
7210 Clairemont Mesa Blvd.
San Diego, CA 92111

When Marc Brooks graduated from the University of Hawaii, in 1978, he and his father Herm (a 30-year veteran in electrical engineering) started up a small firm that designed data acquisition devices used in harsh environments. Since they used the H-89 as the basis for their systems, they ultimately became a Zenith Data Systems dealer and service center.

Through his participation in the local Heath Users' Group, Marc's firm designed a disk controller card that would handle both 5.25" and 8" floppy drives in versions for both the old H-8 and the H-89. During the next few years, a couple of minor enhancements were produced, the most important of which was the ability of their controller card to handle the high-density 1.2-MB floppy drives now used in the IBM-AT, as they used the 8" floppy recording format. But the bulk of their efforts were confined to setting up computer systems for local businesses and educational institutions.

In 1985, as the SCSI hard disk interface became the emerging standard, C.D.R., with the assistance of several local HUG members, began work on a 2-board sandwich that plugged into the '89s left side and tapped into the Z80 CPU via a shielded cable. It was called SUPER RAM 89, and contained a whopping 1-Megabyte of RAM, a system clock and a SCSI hard disk interface that conformed to the Adaptec ACB-4000 standard, and was capable of also performing as a network interface.

This product, which took advantage of the latest chip design technology, offered users of the '89 an inexpensive upgrade that would add extra years of life in a rapidly changing computer market. Early in 1986, they released a SCSI hard disk interface for the Z-100 that offered an alternative to Zenith's over-priced Z-217 board and used high-capacity drives in place of Zenith's paltry 11-MB units.

Software currently under development will ultimately allow users of C.D.R.'s SCSI interface to connect H-89s, Z-100s and IBM compatible computers in a network, each performing tasks best suited for their purposes.

Lee A. Hart
Technical Micro Systems, Inc.
P.O. Box 7227
Ann Arbor, MI 48107

When the IBM began to emerge in full force, Lee Hart, a talented engineer and systems consultant, set out to design a replacement CPU board for the '89 that combined the Z-80 CPU for 8-bit compatibility and the 8086 CPU for entry into the 16-bit world.

Called the H-1000 board, it originally contained only 256 RAM, using 64K chips. When the 256K became widely available at reasonable prices, the board was modified by means of a new memory decoder (in addition to new software drivers) so that it could handle a full Megabyte of RAM.

The H-1000, like many transitional hardware modifications, lacked the ability to emulate the IBM graphics and thus neglected to achieve a wide following. Since the boards were custom made to order, there was usually a waiting period of several months. They were also expen-

**continued on page 266**


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# The MacWorld Expo Experience

by L. J. Kutten

Those of you that did not attend the recent Third Boston MacWorld Exposition, count your blessings. Sure, the show had a lot of new and interesting products, but I would not wish Boston or the Bay Side Exposition Hall on my worst enemy.

Feel free to disagree as I put the case.

The cabs and cab drivers in Boston were atrocious. Unlike most other cities, if a driver decides not to take you to your destination, he doesn't have to. On my trip from the airport to the hotel, I got a driver who decided to read the newspaper as he drove down the freeway. Later that day I and two other people attempted to share a cab to go to the Exposition Hall. The first driver went two blocks and then remembered that he had never heard of the Bay Side Exposition Hall, therefore he kicked us out of the cab. The next day there was a long line of people waiting outside the Exposition Hall for cabs to their hotels. I saw three different cabbies pull up and say they would only take passengers to the airport.

The services in the Exposition Hall were just as horrendous. The food service was slow, understaffed, and overwhelmed by the crowds. The exhibitor's lounge ran out of food and drink (these were being sold, not given away) by early morning and there were no replacements. Telephone service was close to nonexistent. The only phones that could place long distance calls were the public phones. Unfortunately they were located in the noisiest part of the hall (one was right next to a seminar hall). On the second day, I found a press kit from Aegis. It announced two products. The company was not listed in the guide but the service representative told me they were showing. The only problem was that she did not know where.

The greatest person was the security guard who told me I had to get a pass to take press kits out of the hall since I did not have a receipt showing I had purchased them.

### Hardware Shown

Hard drives: The most prevalent hardware products on the show floor were SCSI hard disk drives. There were at least seven different manufacturers and to be honest, I had a hard time telling one from the other. All the units appear to offer the same capabilities and have the same approximate price, give or take five percent. To me the most unique hard drive announcement was the HyperDrive FX-20, by the General Computer Corporation. General Computer is the company which originally rose to fame and fortune by having the first internal hard drive for the Macintosh. Supposedly they have seen the light, and feel there is no market for external units. (This is probably due to the fact that SCSI units can be chained together to generate a lot more storage than possible with an internal drive.) According to General Computer, the FX-20 is unique because it comes with several utility programs that allow the user to encrypt data, have a LaserWriter-compatible print spooler, and a back-up utility.

However, there is one bit of information I got from a General Computer engineer that caused me to shudder: an FX-20 can only be chained to another FX-20. In theory any SCSI hard drive should be able to work with any other SCSI drive. Not so with the FX-20. General Computer is so proud of its utility programs that they made them so that they will only work with the FX-20. If you must rush out and get an FX-20, be warned that its suggested price of $1995 is over twice what the competition costs.

Big screens: The most unique new products were large screens for the Macintosh. A number of vendors were showing them. Two of the more popular vendors (dictated solely by the crowds around them) were The Big Picture by E-Machines and MegaScreen by IDT Systems. The Big Picture is a 17-inch monitor that displays 1024 by 808 pixels, while the MegaScreen is a 20-inch monitor that displays 1024 x 1024 pixels. Both systems use a clip-on display controller that attaches to the Macintosh. These units are very expensive. However, for some applications they would be very useful. For example, in Pagemaker, an entire page layout, the command boxes, and the like are visible at one time. Depending on the software, you can drag the pointer from the big screen onto the Macintosh screen!

Recoverable RAM Disk: The most useful hardware product I ran across was a recoverable RAM disk system for the Macintosh Plus. Called MacSave and manufactured by MacMemory, Inc., this product allows you to recover data stored on a RAM disk in the event of a crash. Merely press the reset button and the data is recovered.

The MacSave unit plugs internally into the Macintosh Plus's ROM sockets. No special skills or modifications are required. MacSave has a suggested price of $119 and is worth every penny if you use a RAM disk.

### Software

The new software shown at the show was rather eclectic. There was nothing truly outstanding that falls into the "must buy" category. The two most interesting products were dBase Mac by Ashton-Tate and Works by Microsoft. Both products were only being demonstrated and shipping will have started by the time you read this. Both products appear to work reasonably well. Of course, the moment I tried to lead demonstrators from the primrose paths of their demos, they got a glazed look in their eyes and told me to talk to technical support. Needless to say, whenever I looked for technical support, they were not available.

Luckily not everyone followed their primrose paths so neatly. A number of vendors did volunteer to answer questions responsibly. The product descriptions that follow are from these vendors.

Desktop Art: Simply put, this product is nothing more than a series of high quality MacPaint and *MacDraw* documents for desktop publishing. However they are more than another collection of images—they are of the highest quality I have seen to date. The entire library consists of five volumes, each of which contains more than 200 illustrations. Areas covered include sports, education, the seasons, a general potpourri of illustrations, and graphics/symbols. These drawings are not cheap. One volume costs $74.95, two $129, and the entire set is $279.

**True BASIC:** This is the newest implementation of the BASIC computer language. Developed by John Kemeny and Thomas Kurtz, the original developers of BASIC, True BASICs syntax is hardware independent. This means that programs developed on the Macintosh with it will be directly portable to any other systems supported by True BASIC. Currently this includes the IBM PC and the Commodore Amiga.

The Macintosh version of True BASIC allows programmers to access the Macintosh Toolbox, the QuickDraw routines, the Window Manager, and the Font Manager. It makes 100 percent of RAM and 98 percent of ROM-resident routines available.

True BASIC has a suggested retail price of $149.90. The True BASIC system includes a floppy diskette, a reference manual, a user's guide, and a quick reference guide.

RagTime: This is an integrated page processor that delivers a fully-functional WYSIWYG (what you see is what you get) editor like PageMaker or MacPublisher II. The developer, Orange Micro, was only demonstrating a beta version and shipment will take place in the future. The program includes a word processor, form generator, and spreadsheet. The word processor seems to be between MacWrite and Microsoft Word in capabilities. The spreadsheet is adequate. It has over 55 built-in functions and can support 253 rows by 253 columns. Similarly, the forms generator seems to work reasonably satisfactorily. It can directly import MacPaint and MacDraw documents, scale pictures, and move them about a page using the "hand" option.

While the developer answered all my questions, I was unable to actually try the program the three times I went by the booth.

RagTime requires a Macintosh 512K or a Macintosh Plus. Also either an 800K disk drive or hard drive is required. Final pricing has not been determined but if it is anything over $300, the product will be overpriced.

WriteNow: This is still another word processor for the Macintosh. Scheduled for release in October, this program appears to be a programming miracle. Not only will it work on a 128K Mac, but it permits an unlimited number of opened documents (I will believe this when I see it); can put up to four visible columns of text on the screen; has its own built-in 50,000 word dictionary; has automatic footnote tracking (if it allows a footnote to be longer than one page, it will do something

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**MacUniverse**
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gram I have yet seen for the Macintosh. Developed by the Boston Computer Society, it delivers both full multitasking capabilities and humor in one program. This is a definite must have for any serious Macintosh user. TaskMaster can be found in DL6 under the name TSKMST.BIN.

**Products mentioned in this column:**

Apple Hard Disk 20SC—$1295 (manufacturer's suggested retail)
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Rainbox Color Diskettes—$45 (ten single-sided) $55 (ten double-sided)
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Elmsford, NY 10523
(800) 423-6870

Mac dBase—$495 (MSR)
Ashton Tate
20101 Hamilton Avenue
Torrance, CA 90502
(213) 329-8000

Kensington System Saver—$99.95 (MSR)
251 Park Avenue South
New York, NY 10010
(800) 475-5200 ●

**Expanding Your H/Z continued from page 263**

are probably a large part of the potential market for A86, this limitation needs to be addressed, either through an extra cost book, or an upgrade of the on-disk text files. At the very least page numbers and an index/table of contents should be added.

The next problem is related to the cost of the total A86/D86 package. While $40 is a very reasonable price for an assembler like A86, asking for $80 to register both the programs is a little high. Even though it is still less than some assembler packages, if you are going to spend $80 for A86/D86, you can get MicroSoft's MASM, along with a nice printed manual, and a program roughly comparable to D86 (MASM's SYMDEB), for just a few dollars more from many discount software dealers. I think we need to realize that even if A86 was superior to MASM in every way, the packaging and support of MicroSoft makes it a better value in many potential customer's minds.

For a limited time, Mr. Issacson allowed for a package deal, registering BOTH A86 and D86 for $50. I think he should consider a more permanent offer at that level, or perhaps a little higher if need be. This would make the A86/D86 package very competitive in price. If the price is to stay at the higher $80 rate, then I think upgraded documentation, and rounding out of the extra features still missing from A86 (.OBJ files, 8087/287 code, etc.) will be essential.

### Where Can I Get a Copy?

If this review has already convinced you that A86 is for you, you can get the latest version directly from the author for $50 ($40 registration and $10 disk fee). The full address and a local BBS contact for him, can be found listed at the end of this article. If you still want to see A86 running on your own machine first, before you register, then you should start searching the BBSs and SIGs, because A86/D86 should be on its way soon (if it's not already there).

Like copies of other Public Domain/Shareware disks I've offered in the past, I'll also make copies of a disk with both A86 and D86 on it. It's a 5.25 in. MS/PC-DOS formatted disk for $5 (U.S. Funds), postpaid in the U.S. and Canada. (Foreign orders, please include US currency or money order, and a sufficient additional amount for postage.) Readers should send their order to:

Drude Micro Services
P.O. Box 533
Cedar Falls, IA 50613

In case anyone is interested, the V-20/CPM emulator disks, and PC-Sprint disks are also still available at $5 each, from the same address. Please specify the exact disk you are requesting!

### An Endnote: Who is This Eric Issacson Guy, Anyway?

As a final note here, you may be wondering just who would write programs of the caliber of A86 and D86 and then distribute them as Shareware. Well, Eric Issacson is the guilty party. And, in case you haven't heard of him, you probably should have...but don't feel alone. I hadn't heard of him either...until I ran across A86.

Eric is the co-author of the original 8086 macro assembler: Intel's ASM86. That was the assembler that originally ran on Intel's own MDS development systems, way back when MS-DOS had yet to be written as Seattle Computer's QDOS, and IBM had yet to build their first PC. Eric helped Intel code ASM86 and then (apparently) moved on. He's working for himself now, and is regarded as one of the expert Gurus on the entire 8086 family of micros. (Wiley Publishing has him busy writing their upcoming 80386 manual.)

Until recently, Eric was busy working primarily with Altos 8086-based multi-user systems. A86 was originally developed over two years ago, first running on Eric's own proprietary 8086 operating system. He then ported it over to the Altos running Xenix and then, apparently, ported it over to MS-DOS.

Eric states that he's now going to jump into PC software with both feet. Even though A86 is his first start into the PC world, obviously neither Eric, nor A86, is a new kid on the block. The assembler has the feel of being written by someone who has lots of 8086 assembler software development under their belt. (The special macro features and language extensions come to mind here.) I can't wait to see what's next!

### Robert Maskasky's New Character ROMs for H/Z-150/158s

A few months ago, I mentioned that the H/Z-150 color video card was capable of displaying both IBM-compatible double-dot text characters, and an H-19 compatible single-dot character set. As we saw, the jumper selections that are specified in the H/Z-150 Operations Manual is incorrect. The correct information is to put jumper J302 in the 1 position, and J305 in the 1 position. Then, when you power up, you'll default to the single dot mode. (You can also switch between the fonts, when powering up single dot, by using the CTRL-ALT-I/CTRL-ALT-N keystrokes we documented in an earlier column.)

Although the single dot character set is more legible (for some users), it has the disadvantage in that it is not completely compatible with the IBM text graphic characters. That means that characters in the upper range (ASCII values greater than 128) aren't the same for both sets. When running software that used the IBM text graphic characters, it's disconcerting to see the difference.

Well, Robert Maskasky has also solved this problem. He's designed two new character generator ROMs, one for the H/Z-150 video card, and another for the H/Z-158 board. These ROMs provide a completely compatible single dot character set that is equivalent to the IBM double dot set. You can also switch between the sets, just like the normal char. gen. ROM.

The H/Z-158 ROM is $35, and the H/Z-158 version is $25. (The price difference is due to the fact that the H/Z-150 uses an oddball ROM configuration and requires a more expensive

**continued on page 267**


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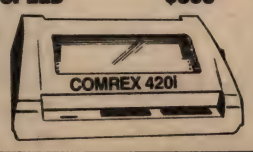


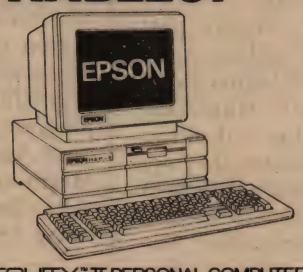


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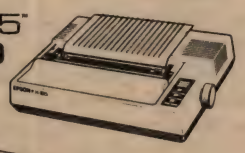

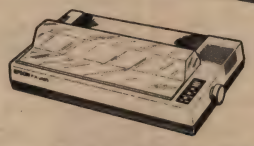

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**Survivors continued from page 264**

sive, costing more than $1200 each with support software.

But what a system. It could handle a lot of generic MS-DOS software like dBASE, and other integrated packages that contained a terminal installation program. It was fast—so fast, in fact, that when it was tested for mathematical computation speed and data base sorting, it left the IBM-AT in a cloud of dust.

Since the cost of integrated circuits has dropped, the price of the H-1000 has been cut nearly in half, making it a worthwhile investment for those who still use their '89 for business purposes. There have been hints that an IBM graphics emulator card is in the works, and I'm keeping my ears open.

TMSI has also produced low-power CMOS kits to replace heat generating IC's within the '89—always a key gripe about the computer—and WRITE-HAND MAN, a CP/M equivalent to Borland's popular SIDEKICK.

* * *

During the '89s life-span, as with other systems of its time, support vendors have come and gone. The survivors have managed to keep pace with the ever-changing technology and transferred their creative talents to the new systems.

These aren't the only survivors in the Heath/Zenith arena. They are probably the best for many reasons—innovation and business acumen being the primary factors. But they have one other thing in common. They established a personal rapport with their customers that instilled trust, in an industry that has become very impersonal and all too often advocates a buyer beware attitude. ●

# Programming Languages: Featuring the IBM PC And Compatibles

by Michael A. Banks

Among the many debates raging in the microcomputer world, the argument over which programming language is "best" is perhaps the most lively, and the least likely to be settled. But, if you are searching for the microcomputer language for your particular application, you will have no problem getting advice. Any programmer will tell you just which language to use—and why.

The problem with all of the free advice floating around is that programmers tend to be fiercely loyal to the language that they use most often (or, at least, the one that they have the most experience with). A Pascal programmer, for instance, will tell you that you need to use Pascal because of its error-checking features, while a C programmer will tell you that Pascal is outmoded and slow compared to C, and you can check for errors yourself. Language-loyal programmers with other allegiances will provide similar arguments.

Any computer language has features that make it better in some respects, and worse in others, than another language. What is important for the uninformed programmer is to be able to figure out which language offers the most features for his or her particular application. It is, unfortunately, difficult and time-consuming to discover both the strengths and weaknesses of a particular language, on a comparative basis, by talking with a loyal user.

Enter Marc Steigler and Bob Hansen with *Programming Languages: Featuring the IBM PC and Compatibles*. This book is, according to its authors, a guide to the significant differences between 12 of the major microcomputer languages. Rather than setting out to make the reader an expert in any one language, the authors' intent is to highlight what makes a language unique, and to supplement this information with references and with a demonstration program to exhibit how the languages handle specific problems.

The book opens with a discussion of program modularization and abstraction, then moves into a presentation of a program called "Racetrack," which is the demonstration program. Listings for the program are provided in each of the 12 languages covered.

The structure of the chapters dealing with the individual languages is straight forward enough. Each chapter begins with a history of the language, and a catalogue of its features, followed by advice on when to use the language, references, and the "Racetrack" program listing.

The book is broken into sections, into which the language chapters are categorized, and this is most helpful for the novice seeking to get a "feel" for the world of computer languages. The first section covers BASIC. Section 2, headed "Languages of Yesterday," deals with FORTRAN and COBOL. Under "Languages of Today," one finds RATBAS, Pascal, and C. MODULA II and ADA are covered in Section 4 as "Languages of Tomorrow," and APL and FORTH are tagged "Addictive Languages." The final programming language section is headed "Special Purpose Languages," and covers LISP, dBASE II, and Assembler.

*Programming Languages: Featuring the IBM PC and Compatibles* is the fifth book in the *Pournelle Users Guide* series from Baen Books. According to the blurb on the back cover, Jerry Pournelle personally guarantees that every title in the series delivers on its promises. Considering the overall quality of this book, he should have no second thoughts about that "guarantee." There is no excess verbiage here, and the authors know their topic. For the reader willing to invest a few hours, this is an excellent guide to the basics of specific computer languages, and to the subject of computer languages in general. It will not make the reader an instant expert, but serves as a good springboard to detailed study of a specific language.

*Programming Languages: Featuring the IBM PC and Compatibles*
Marc Stiegler and Bob Hansen
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**Expanding Your H/Z**
**continued from page 266**

replacement.) I've tried the H/Z-150 version, and it works fine with all the software I ran using it. For further information, see Robert's address at the end of the article.

**Coming Up in Future Columns**

Down the road, I'm planning on presenting more information about the H/Z-150/58 series of machines for our readers. I've been compiling a general list that details the technical differences between the H/Z-150/58 series and the IBM-XT line. If you have anything you would like to contribute along these lines, for possible publication in a future column, please feel free to contact me at the address mentioned earlier, or c/o *Computer Shopper*. Until next month, happy holidays, and happy computing!

**Products Mentioned In This Column:**

A86 Macro Assembler/D86 Symbolic Debugger, $40 Registration Fee (ea.) plus $10 disk copy fee. Eric Issacson, 416 E. University Street, Bloomington, IN 47401, BBS Contact (812) 824-7990.

Custom Z-150 Character Gen. ROMs, $35 (H/Z-150) or $25 (H/Z-158) Robert Maskasky 3220 Carlton Ct., Green Cove Springs, FL 32043. ●


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**Computer Book List continued from page 129**

and tricks. Contents include: Application development in assembler, structured programming techniques, real time programming, 8087/8088 co-processing, and recovery of lost data. A good title for the developer.

***Amiga ROM Kernel Reference Manual:* Libraries and Devices**
Edited (CBM)
Addison-Wesley — $34.95
Pages: 544—Copyright: 1986

The long awaited and eagerly sought after *ROM Kernel Manual* contains a complete listing and description of the Amiga's built in read only memory (ROM) routines which support graphics, sound and animation. Assumes a basic knowledge of C and Assembly Language. Other titles in the series include *Amiga Hardware Reference Manual* [$24.95] and *Amiga ROM Kernel Reference Manual:* exec. [$24.95] Also available are *Amiga Programmers Handbook* [$24.95], *Amiga Programming Guide* (Que) [$18.95]. *COMPUTE!'s Amiga DOS Reference Guide* [$14.95] and *COMPUTE!'s Amiga Programmers Guide* [$16.95]

***Complete Turbo Pascal***
Duntemann
Scott Foresman & Co.–$22.95
Pages: 540 — Copyright: 1986

Written for programmers new to Pascal, this is an excellent guide to Borland's best selling Turbo Pascal Compiler. After a complete tutorial on the Pascal language, there follow detailed instructions on installing, modifying and using Turbo Pascal on both MS-DOS and CP/M based systems.

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***Using Turbo Prolog***
Robinson McGraw-Hill
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**The TI Forum continued from page 261**

back on. For programs that are thoroughly debugged, there's no need to have the entire program prescanned. There are certain rules that need to be followed for the insertion of the prescan toggle commands, though, which make modifying a program that doesn't use !@P– and !@P+ very time-consuming.

If one plans to use the prescan commands in advance of writing a program, it is not that difficult to incorporate them. All variable names must be noted, and all subprogram names (i.e. any kind of CALL command) as well. The idea is to have a few lines at the beginning of a program containing each CALL command used once, and each variable used once. The prescan can then be turned off for the rest of the program. The improper use of pre-scan commands will cause a syntax error for such valid commands as CALL CLEAR.

Pre-Scan It will take an existing XBASIC program in MERGE format on a disk and rewrite it to include the various !@P– and !@P+ commands. On the programs I sampled PSI with, the initial time between RUN and actual execution was cut in half at the least, and almost completely eliminated at best.

PSI will also optionally change five selected constants to the variables "@". "[", "]", "_", and "\", which, according to the manual, "take only ⅓ as much space." Perhaps it was the type of XBASIC programs I was experimenting with, but I noticed no decrease in overall size on disk after requesting this option.

Pre-Scan It does take awhile to modify a program—about 10-15 minutes for a 30-40 sector XBASIC program. It will work with or without the 32K Memory Expansion, and also has "modules" on disk for other brands of Extended BASIC—Myarc, Mechatronics, and Millers Graphics Extended BASIC modifications. "More files will be created for other versions as necessary and distributed free of charge," says the manual.

The documentation for PSI is acceptable, although it seems to have a lot of description of the program's features without concrete examples for use and explanations of the program's messages.

At $10, PSI is an excellent value, for both the XBASIC programmer and anyone who uses Extended BASIC programs. Most commercial XBASIC programs can be handled by PSI, so its uses are many to even the non-programmer.

When combined with Oak Tree Systems' SMASH program, another fine XBASIC utility that actually compacts lines and variables. PSI can have a major niche in the programmer's toolkit.

The program, as far as I could tell, was bug-free (although the manual had some typographical errors) and quite user-friendly.

For more information on Pre-Scan It!, or to order, contact Asgard Software, PO Box 10306, Rockville, MD 20850.

J. Peter Hoddie should be congratulated for yet another original and useful program for the 99/4A. ●


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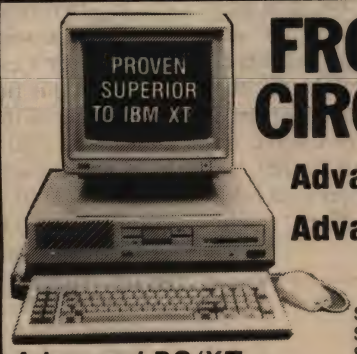


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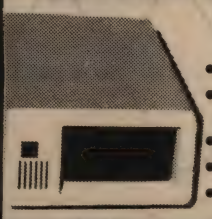

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**Screen Print continued from page 108**

checks bit 7 (the last one on the left). If it is set (it's a 1) then this signals a graphics character and in line 270, since it is not zero (NZ), we go to GETGR1 where the print character routine (PRTCHR) is called.

Line 750 (PRTCHR) we AND 3 (which means we zero out all but the two bits on the left) of the byte in A. Next we PUSH the present HL onto the stack (screen position). We load E with A (has the value of top two characters of our graphics CHR$), D is loaded with 0 to complete the DE pair we are using. HL is pointed to the table holding values for the printer graphics. (800) Depending on the value in DE (top two CHR$), HL points further down the graphics table. (810) Load the accumulator with the contents of HL. (820) POP HL off the stack (screen position). (830-850) Print character on printer and return to 320.

There HL is increased by 1 (next screen position). (330) We subtract one from B and if it's not zero we go back to TOPLIN and finish looking at the top two pixels. When B is zero, we drop down to 340-350 and call for a carriage return. (360) Get our first screen position again. (370) Save it for the third pass. (380) 64 characters in a line. (390) Get CHR$ value. (400) Check for graphics. (410) Print graphics. (420) If not graphics, print alphanumeric characters this time. (430) Go to next screen position.

(440-460) This command moves the bits inside our graphics byte. By moving the bits two places to the right, the middle character string positions are now in the first two positions and we can use the same routines without further modification in order to print the middle two pixels of our graphics character (Table 3).

The third pass (510-670) is the same as the first. Print a blank (560) if it is not a graphics character and (590-620) shift bits four places to the right for printing the last two pixels.

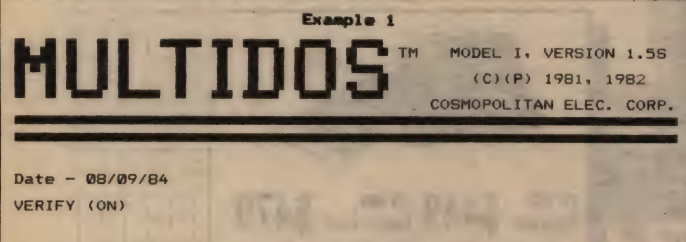
Line 680 restores our line count and (690), if we are finished, restore the original registers and return to your program.

After saving this program on disk with a /CMD or /CIM suffix, from an editor/assembler, you can load it from DOS READY with the LOAD command. Remember to protect memory (48K = 65279, 32K = 48895, 16K = 32511) before running your BASIC program. In Disk BASIC, use a DEFUSR0 = $HFF00 (&HBF00 for 32K, &H7F00 for 16K) and use X = USR0(X) to call the printer subroutine.

Program Listing 2 (Radio Shack) and 3 (Gemini-10x) have a short draw program with the subroutine POKEd into high memory. The letter "P" is pressed to call the printed subroutine. Memory is protected by CLEARing some memory and POKEing 16561 and 16562 with the values to protect the POKEd program.

Example 1 shows the MULTIDOS logo by directly calling the program from DOS. Example 2 shows a screen dump from a draw program and Example 3 shows a simple copy from the draw program included with the subroutine in the article. ●

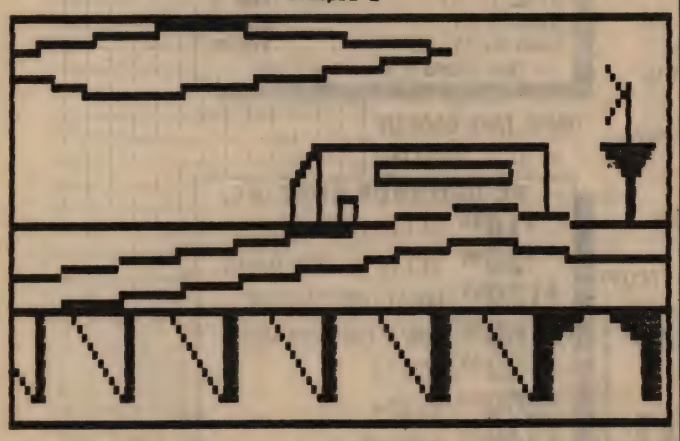
Example 1




```
Date - 08/09/84
VERIFY (ON)

Multidos ready
SCRPRT
```

Example 2



Example 3

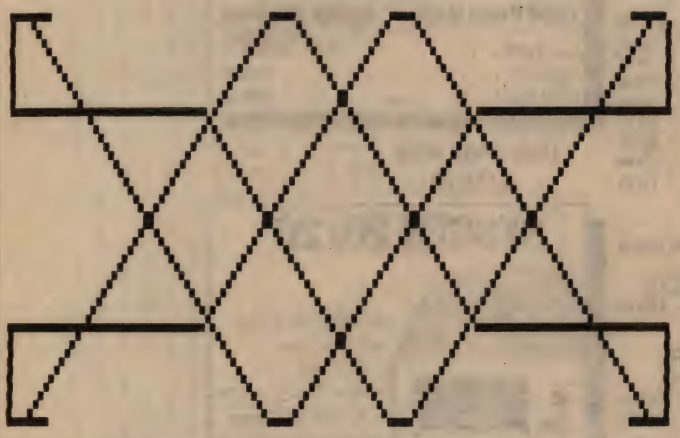
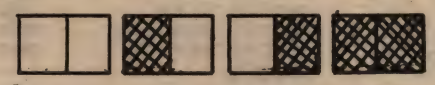


Table 1—Printer Graphics



| | | | | |
|---|---|---|---|---|
| | 224 | 233 | 234 | 239 |
| Program table value | 0 | 1 | 2 | 3 |

Table 2—BYTE Configuration

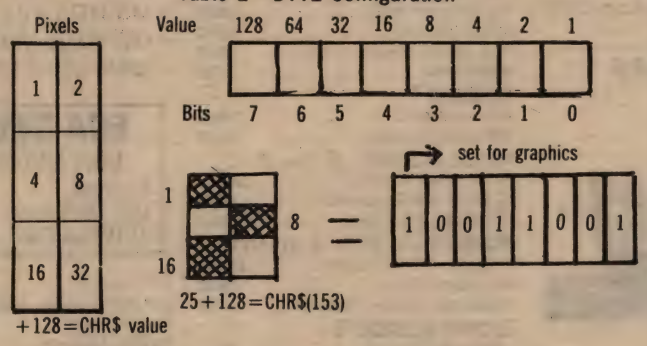
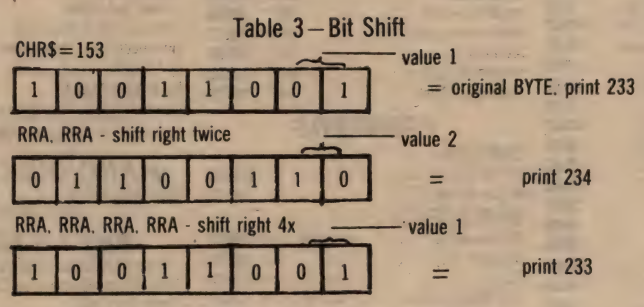



Table 3—Bit Shift





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|---|---|---|---|---|---|---|---|---|---|---|
| C ITOH Prowriter 1550-8510, NEC 8023-8025, APPLE DMP-IMAGEW | 1/2 x 18 | $15/2 | $42/6 | $ 78/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| IBM PROPRINTER (Standard Paper) (4201) | 7/16 x 20 | $18/2 | $51/6 | $ 96/12 | $8/1 | $7 ea | 2 or more | $18/3 | $66/12 | $360/72 |
| PC (Standard Paper) (5152) | 1/2 x 20 | $14/2 | $36/6 | $ 66/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| RADIO SHACK-TOSHIBA-COMMODORE-PANASONIC-RICOH | | RS LP-I-II-IV, CENTRON | | | 730-737-739-779 (Zip Pack) | | | $12/3 | $45/12 | $252/72 |
| Carbon Film - DWP 210, DIABLO HYTYPE II Black (1445) | 5/16 x 145 | $18/3 | $60/12 | $342/72 | $5 ea 3-11 | $4 ea | 12 or more | $24/6 | $42/12 | $234/72 |
| DW II, DWP 410-510, RICOH 1200-1300-1600 Black (1419) | 1/4 x 145 | $18/3 | $60/12 | $342/72 | $5 ea 3-11 | $4 ea | 12 or more | $24/6 | $42/12 | $234/72 |
| Red, Green, Blue, Brown Colors (1419) | 1/4 x 130 | $21/3 | $72/12 | $414/72 | $6 ea 3-11 | $5 ea | 12 or more | $30/6 | $54/12 | $234/72 |
| Fabric (Long Life), DWP 210, DIABLO HYTYPE II Black (1458) | 5/16 x 17 NOT EZ LOAD | $18/2 | $51/6 | $ 96/12 | $8/1 | $7 ea | 2 or more | $21/3 | $78/12 | $432/72 |
| DW II, DWP 410-510, RICOH 1200-1300-1600 Black (1449) | 1/4 x 25 | $18/2 | $51/6 | $ 96/12 | $8/1 | $7 ea | 2 or more | $21/3 | $78/12 | $432/72 |
| DMP-100, LP VII, COMMODORE 1525, GORILLA BANANA (1424) | Inker Loop | $18/2 | $51/6 | $ 96/12 | ---------- | | | ---------- | | |
| DMP-200, 120, (430 Inserts & Reloads Only) (1296) (1483) | 1/2 x 20 | $20/2 | $57/6 | $108/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| DMP-400-420, LP VI-VIII, PANASONIC KXP-130-1093 (1418) | 5/16 x 14 | $15/2 | $42/6 | $ 78/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| DMP-500 (130 Inserts & Reloads Only) (1236) (1482) | 1/2 x 20 | $22/2 | $63/6 | $120/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| DMP-2100, TOSHIBA P1340-1350-1351-351 (1442) | 1/2 x 20 | $15/2 | $42/6 | $ 78/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| DMP-2200, C ITOH 3500 (1233) | 1/2 x 52 | | $35 each | | $18/1 | $16 ea | 2 or more | $30/3 | $57/6 | $108/12 |
| LP III-V, CANON A 1200 (New Only) (½ x 5) (1414) | 1/2 x 15 | $15/2 | $42/6 | $ 78/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| EPSON LQ 1000 | 1/2 x 18 | $22/2 | $63/6 | $120/12 | $8/1 | $7 ea | 2 or more | $18/3 | $66/12 | $360/72 |
| MX-FX-RX 70-80-85, LX 80-90 (5/16 x 7) | 1/2 x 20 | $14/2 | $36/6 | $ 66/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| MX-FX-RX 100-185-286, LQ 800 (1/2 x 18) LQ 1500 (1/2 x 14) | 1/2 x 30 | $18/2 | $51/6 | $ 96/12 | $8/1 | $7 ea | 2 or more | $18/3 | $66/12 | $360/72 |
| DX 20-35 Carbon Film (Multistrike), OLIVETTI ET-121-221 | 5/16 x 290 | $21/3 | $72/12 | $414/72 | (Call for Correctable Prices) | | | ---------- | | |
| NEC Spinwriter-Carbon Film - 2000-3500 (Reloads BCCOMPCO Only) | 5/16 x 145 | $18/3 | $60/12 | $342/72 | $5 ea 3-11 | $4 ea | 12 or more | $24/6 | $42/12 | $234/72 |
| - 5500-7700 (Can Reload Most Types) | NOT EZ LOAD 1/4 x 145 | $18/3 | $60/12 | $342/72 | $5 ea 3-11 | $4 ea | 12 or more | $24/6 | $42/12 | $234/72 |
| -Fabric - 2000-3500 (Can Reload All) | 1/2 x 14 | $18/2 | $51/6 | $ 96/12 | $8/1 | $7 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| - 5500-7700 (Can Reload All) | 1/2 x 13 | $15/2 | $42/6 | $ 78/12 | $8/1 | $7 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| Pinwriter P1-P2-P6, P-5 (1/2 x 14) | 1/2 x 20 | $25/2 | $69/6 | $126/12 | $7/1 | $6 ea | 2 or more | $15/3 | $54/12 | $288/72 |
| P3-P7 | 1/2 x 27 | $30/2 | $84/6 | $156/12 | $8/1 | $7 ea | 2 or more | $18/3 | $66/12 | $360/72 |
| OKIDATA Pacemark 2350-2410 Black | 1/2 x 100 | | $25 each | | $20/1 | $18 ea | 2 or more | $36/3 | $132/12 | $720/72 |
| Microline 182-183-192-193 (Call for 292-293 prices) | Inker Loop | $20/2 | $57/6 | $108/12 | | | | | | |
| ML-80-82-83-92-93 (Call for ML-84 Prices) | 1/2 x 16 | $21/6 | $36/12 | $198/72 | | | | | | |
| MANNESMAN-TALLY MT-160, RITEMAN INFORUNNER (Inker Loop) | 9mm x 11 | $19/2 | $54/6 | $102/12 | | | | | | |
| MT-180-290 | 9mm x 13 | $20/2 | $57/6 | $108/12 | | | | | | |
| -SPIRIT 80 (SP80) COMMODORE 1526 (Multistrike) | 1/2 x 35 | $16/2 | $45/6 | $ 84/12 | | | | | | |
| PANASONIC KXP-1080-1090-1091-1092-1592-1595 | Inker Loop | $20/2 | $57/6 | $108/12 | | | | | | |
| BROTHER HR-15-25-35 Carbon Film (Multistrike) | 5/16 x 82 | $18/3 | $60/12 | $342/72 | | | | | | |
| COMREX DX-15, II Fabric (Call for Comrex 420 Prices) | 5/16 x 17 | $15/2 | $42/6 | $ 78/12 | | | | | | |

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**Dr. Dr. Zucker**
**continued from page 107**

use one floppy, a slim line 20 Meg in place of floppy B and the hard card?" You can but you need another power supply for one of the hard drives. The 1000's power supply would be pushed too hard to handle both hard drives and a floppy at the same time. You can bet I am going to try it before the hard card goes back to ATD.

The only suggestion I have for ATD is to incorporate a software program that will put an asterisk in the corner of the screen when the hard drive is being accessed or maybe a beep, to let you know that the Tandy hasn't gone off to "Never Never Land" while you sit patiently and wait. I didn't realize how much I referred to the red LED on my hard drive to see what is going on.

I haven't seen Tandy's hard card yet (and don't know anyone that has!). ATD's price beats Tandy by about $200 and has a two year warranty. By the way, their warranty works. I had a memory board that had a DMA malfunction and I sent it back. By return mail I received a replacement—a lot faster than I believed possible. The one other person that has contacted me about the Zuckerboard related a similar experience. No questions or complaints, just quick service. You can't ask more than that from any company.

I have two Tandy 1000s running side by side in my lab. One with a Seagate 20 Meg slim line and one with the hard card. Access time on the hard card is noticeably faster than the 5¼ capsule. Others have told me that their 3½" drives have a faster access than their 5¼s.

Just before I turned this in to *Computer Shopper* I received the new documentation from ATD for the hard card. It is very simple; consisting of two pages that cover the installation, problems that might arise and how to re-format if you are so inclined. Even though they are brief, the instructions are more than adequate for most folks. Using the directions, one of my students in the 10th grade installed the card without problems. This student had never seen the inside of a computer before she took the cover off the Tandy 1000 and it only took a total of five minutes to complete the task!

If you are in the market for a hard drive for your Tandy 1000 you will be hard pressed to beat the Zucker Hard Card. It allows you to retain both floppies and still have a hard drive. It is quiet and very efficient. Ease of installation is definitely a plus. If you have put any card in a computer you have all the experience needed to install this hard card! As you can see from the photo, the board is neat and doesn't crowd up the computer with cables. The company is reputable and willing to not only stand behind their products but help you over the rough spots, if you find any.

Dr. Dr. Zucker has done it again! Keep up the good work out there. I am looking forward to your next addition to the Tandy 1000 line.

The Zuckerboard Hard Card for the Tandy 1000, $599. Advanced Transducer Devices, 235 Santa Anna Court, Sunnyvale, CA 94086. 800-233-6874. ●


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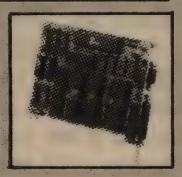

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**MacWorld Expo continued from page 265**

Microsoft Word cannot do); allows graphics on the same line as text; can do font-specific changes; and is not copy-protected.

To be fair WriteNow is being distributed by T/Maker Co. This is a very reputable company and if I were a betting man, I would bet WriteNow will substantially fulfill the hype T/Maker has put out. If you want WriteNow right now, be prepared to spend $175.

Adobe Fonts for the Macintosh: Adobe Systems, developers of the PostScript language for the LaserWriter, announced the availability of additional downloadable fonts for the LaserWriter. These new fonts include Lubalin Graph, Gramond, American Typewriter, Benguiat, Gulpha Roman, Baskerville Roman, and Mediaevla Roman. Prices range from $145 to $185 for a package that works on only one printer and from $295 to $385 for a package that operates with up to five printers.

All Adobe fonts come with a unique copy protection scheme that reads and writes a serial number from the LaserWriter. Be warned that a number of people have reported problems with this copy protection scheme.

1st Aid Software: For the company with the most guts, the award would have to go to 1st Aid Software. Even though it had no product to show (not even a beta version), it nevertheless attended. Their system, if it ever gets released, is a four-disk package that is a file and disk recovery system. Assume that a file is corrupted and your data is not readable. Using their system, you read the specific error message, pick the relevant conditions, and follow their step-by-step recovery instructions.

The program is not presently designed to work on a Macintosh Plus but should work on all other Macs. The program is not copy protected and will have a suggested retail price of $89.95.

Mac-Hy-Phen: For those of you interested in the best-looking justified text, take a serious look at Mac-Hy-Phen. I got a demo copy from the author which I have tried and liked. I do not know if the product is shipping, but if it is not, it should be. I could not crash it once over a two-week period. It is a hyphenating dictionary. Working through a desk accessory, you copy the text to be hyphenated into the clipboard and then into the Mac-Hy-Phen clipboard. The text in the clipboard is then hyphenated (discretionary hyphens are placed in the words) and you paste it back into the document.

Mac-Hy-Phen suffers from three major limitations. First, it is not a fast product. It took approximately three minutes to hyphenate this article. Second, since it works through the clipboard, you lose all of your character and paragraph formatting when you paste the hyphenated text back into the document. Finally, not enough words are hyphenated. Among the words in this article that were not hyphenated were approximately, capabilities, recommended, and simplistically.

Mac-Hy-Phen does contain approximately 40,000 words and takes up 230K. A hard disk system is recommended. I have no idea as to price, but would be surprised if it is over $75.00. If it is, you probably need a darned good reason for buying it.

**Products Mentioned in this Article**

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HyperDrive FX-20—$1995 (MSR)
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Cambridge, MA 02142
(617) 492-5500

RagTime (Price not set at press time)
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WriteNow—$175.00 (MSR)
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MacMemory Recoverable RAM Disk—$119 (MSR)
MacMemory Inc.
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Adobe LaserWriter Fonts—from $145 (MSR)
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1st Aid—$89.95 (MSR)
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Mac-Hy-Phen (Price not set at press time)
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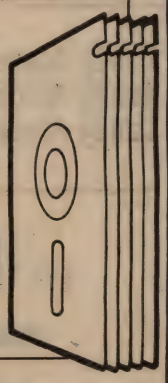

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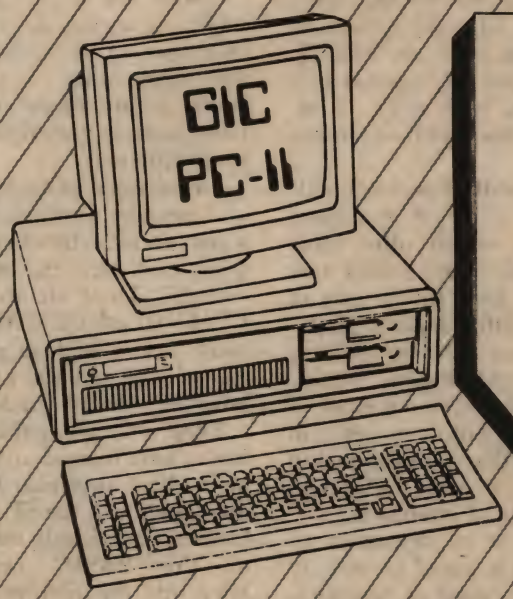


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# Two ST Book Reviews

by H. Clark Robbins

*Atari ST BASIC Training Guide: Everyone's Introduction to ST BASIC* by F. Kampow and N. Szczepanowski, $16.95.
Published by:
Abacus Software Inc.
PO Box 7219
Grand Rapids, MI 49510
616-241-5510

The *Atari ST BASIC Training Guide* promises to make you a capable BASIC programmer. The table of contents promises you fundamentals of programming, beginning BASIC, File I/O, Music and Graphics, and a little about GEM. There are problems at the end of each section and solutions in the back of the book.

In the first chapter of the Training Guide, Fundamentals of Programming, the authors introduce the reader to the frightening [my word] world of ST BASIC. They start you with loading the program and examining the multitude of BASIC windows, and they explain a little about each. They also offer clues about what the "cursor" is and where the carriage return key is located. Since I am new to BASIC, not just ST BASIC, I hoped for the best.

The authors discuss the ST BASIC, with its dialog boxes, file selectors and its many rubber boxes as though nothing were peculiar here. Maybe they'll think we won't notice. There are no compare/contrast discussions of other familiar BASIC languages, and there is no discussion of what might be common to all BASIC languages. When a new topic is introduced it is hard to tell if the subject applies to BASIC or to ST BASIC only.

Many short (one or two line) programs are discussed at the beginning of the book. They are good confidence builders for beginners, allowing you to just create a string for the display. At this point, beginners will start shaking off the fear of the unknown that always accompanies learning a new language.

One of the strongest points of this book is that the authors' goal is not just to teach you BASIC, but to teach you how to program. Pascal may be a good language for learning to write code, but the authors recognize that that's only a third of the job. They recommend that you follow these steps:

- Define the problem and write down what the program needs to do
- Develop the algorithm for solution with flowcharts and data flow diagrams
- Code it
- Thoroughly test it
- Document it

If a beginner will abide by these steps, he is on his way to becoming a top-notch software designer. The authors are to be commended for providing these guidelines and following through with them. In early examples, all these steps are used to give the reader a feel for how and why they are important. The authors choose the task of calculating the surface area of a sphere to demonstrate the design steps, as well as a beginning taste of BASIC.

To help the reader get a feel for the world of computers and software design, there is a thorough discussion of flowcharts, the ASCII system, number systems (with special emphasis on binary and hexadecimal, of course), bits, bytes, and logical operations. This is very helpful to beginners, who will want to refer back to this section as they become more proficient.

At this point in the book there is a glaring error of omission. They never fully cover the editor commands. Having had no exposure to BASIC and little background in the ST, I was forced to look elsewhere for this information before I could continue. I turned to the book that came with my 520 ST, and found it remarkably thorough, with a lot of examples and well-organized text.

The BASIC Training Guide provides a lot of examples, many of which offer some useful code that a reader may want to keep in his bag of tricks. Unfortunately, however, there are a lot of very simple typographical errors. Ordinarily, this is not much of a problem, but many occur in examples that are supposed to illustrate a point. This can cause a lot of confusion.

There is no discussion of how data is stored in memory or the way some of the operations are performed. I have looked at other BASIC texts and they didn't offer this information either. I don't know why that is.

The technical discussions in the BASIC Training Guide are well written and easy to read. The material is a mix of mathematical operations, string manipulations and Input /Output handlers. This is a good way to present the material, since otherwise it would be rather dry. This also makes it difficult to use as a reference, since it would be nice to see all the I/O handlers grouped together.

The discussion of string manipulation is very good. There are some idiosyncracies of the string functions of ST BASIC that are not addressed by this text, but I believe that this is because they aren't very common.

In the authors' attempts to simplify the techniques of programming, there are errors of oversimplification. In an attempt to discourage the use of unconditional jumps (an admirable position, I'll grant you), the authors state: "The disadvantage of unconditional program branches is that you can create only 'infinite' loops with them. Once the program is started, it can be stopped only with <control>G or clicking BREAK." This is simply not true. Take, for instance, the lines

```
10 TYPE A
20 TYPE B
25 GOTO 50
30 TYPE C
40 TYPE D
50 TYPE E
```

In this case, no loop was created at all. Dead Code may have been generated (lines 30 and 40) if there is no GOTO 30 somewhere in the program, but dead code is not addressed in the discussion of unconditional jumps.

There are some cases in which the authors don't follow their own rules. In the intro, they express that you put one BASIC command on a line. In their examples they often stack up instructions.

I used some of their sound and graphics routines. This is a good introduction to what is going on behind the scenes in your ST. There are also some GEM VDI and GEM AES calls used. Just enough to get you started, and give you a feel for how the calls are made.

I enjoyed reading this book, it was easy to read and it has an excellent Appendix: There is an overview of the ST BASIC commands, a handy reference of the BASIC reserved keywords, the solutions to the problems at the end of the chapters, and a list of the BASIC errors.

I can't recommend this book to true beginners to ST BASIC because there is little information about running the editor. Much of what is covered in the BASIC Training Guide was covered in the BASIC book that came with your ST (including a thorough editor discussion). The Training Guide's design hints and programming examples are very useful, but I think you should wait for the next edition by which time many of the errors and oversights will be fixed.

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*Atari ST: Graphics and Sound*
By: J. Walkowiak
$19.95
Published by:
Abacus Software Inc.
PO Box 7219
Grand Rapids, MI 49510
616/241-5510

Graphics and Sound is an introduction to overall graphics and sound fundamentals, as well as the way they apply to the ST. The author covers all topics thoroughly, but in a way that is easy to understand.

The author begins with a discussion of graphics fundamentals. First he explains what graphics can do and the nature of CAD/CAM. Immediately, he begins a discussion of the hardware involved, what it can do, and how this applies specifically to the ST. Here, as in other sections of the book, he includes a talk about the topic in general, even covering peripheral subjects that do not apply to the ST. It really appears that the author wants to make you understand the big picture so you can move into other areas of graphics on other machines.

The author discusses Raster

continued on page 275


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**ST Book Reviews continued from page 274**

graphics and Vector graphics and leads into a section about video RAM. He relates back to work you may have done on 8-bit machines to clear up questions he knew we would be asking. His talk about video RAM moves right into information about the addressing scheme of the 68000, with examples in BASIC that you can type in and try.

In the next section, the author plunges head-first into a look at LOGO. This discussion assumes very little: short programs are provided that you can type in and run. Text accompanies each program to explain the points illustrated by the programs.

Then the part we've all been waiting for: a discussion of GEM and the Virtual Device Interface, VDI. The author explains, "The idea behind GEM, as well as the VDI, is similar to that of the CP/M operating system...the same version of CP/M will run on many different computers, and is not dependent on the hardware. For instance, when CP/M displays a character on the screen, the computer does not send the code of this letter to some memory location. Instead the code is written to a specific register of the processor, which in turn calls up the corresponding CP/M subprogram." His explanations are typically not very wordy, but are very complete.

The author discusses Normalized Device Coordinates and Raster Coordinates and explains how they apply to the ST. Example GEM calls are then presented.

The next section covers two-dimensional graphics: points, lines, circles, and ellipses. He also includes a review of the trigonometry that makes all this possible. Many BASIC programs are included to help you get started. He continues with a discussion of the application programs that you now have the background to work with. Line graphs, pie charts and bar charts are covered, along with a discussion of how each is used and the corresponding BASIC programs that create them.

Next the author tackles more complex topics. He offers a technique for parallel shifting an object, and a way to rotate an image about the origin. As always, he includes a brief discussion of the match involved. After a discussion of matrix mathematics, he shows the reader how to create a reflection with respect to either the x or y axis.

The two-dimensional graphics section ends with techniques for plotting functions. I had no idea it would be this complicated.

Next is the Three-dimensional graphics section. I have to admit that I did not use any of his programs from this section, since most applications work nicely in two-dimensional graphics. He also includes information about using GEM VDI calls to get input from the mouse. Finally, he discusses 3-D graphics as it pertains to 3-D movie-type effects. I doubt anyone will make much use of the 3-D movie techniques, and I feel certain the discussion was only included in the interest of completeness.

The last forty pages of the book deal with the ST's sound capabilities. First the author provides you with the background, including tones, oscillations, octaves, attack, decay, sustain, release and envelope. He discusses the sound chip and an overview of its many functions. This is a very technical discussion, continuing for many pages. For those of you who are interested in plodding through it, there are LOGO, C and BASIC program listings included.

*Graphics and Sound* is an excellent book. From the first minute you sit down with it you will find interesting information and programs to enter in C, LOGO, and BASIC. For those new to graphics, it includes important principles that apply to the "real world" as well as the ST. ●


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# Advanced Turbo Pascal

Reviewed by John Monde

The most popular compiled language for microcomputers is Borland's Turbo Pascal. Although Borland provides an excellent program reference manual there is still a need for more information about this excellent program. *Advanced Turbo Pascal* (ATP) helps fill this need. ATP will be useful to experienced Pascal programmers who are moving to Turbo and even experienced Turbo programmers will benefit from this book.

The work begins with a brief review of Pascal in general and then gives a quick but valuable discussion of the extensions to Pascal that Turbo provides. ATP also presents a list of the differences (limitations) of Turbo from standard Pascal which is practically verbatim from the Borland manual but these limitations are simple and really require no further explanation.

After the introduction the book jumps into the meat of the subject with a chapter on sorting and search techniques. ATP covers the bubble, insertion, selection, shell, and quicksort routines. Under searches only sequential and binary methods are considered. Nothing in this chapter is new or earthshaking but it is valuable and presented in an easily understandable format. Most of us already know that the bubble sort is a horrendously inefficient sort but many of us still fall back to the bubble because it is the easiest sort to code (I plead guilty to that charge). Schildt makes it very clear that we pay a high price for that simplicity. (The bubble sort performs 990 comparisons on an average 100 element array compared to quicksort's 200 comparisons). ATP provides complete examples of all the sorting techniques so you can pick your favorite and add it to your programming library.

The only problem with this chapter is the frequent statements of, "although determining the average case is beyond the scope of this book to develop, it is...." If you are the type of person that just has to know how the number of comparisons were developed you are out of luck. Personally I think this chapter would have been improved if the author had simply included a reference list that allowed the reader to investigate these equations if he was so inclined.

The next two chapters cover data structures. ATP begins with four types of structures that it calls "data machines"; the queue, stack, linked list, and binary tree. Each of the structures are defined in detail with the strengths and weaknesses of each structure explored. This chapter appears somewhat tedious at first reading and the reader may wonder why Schildt spends this much detail on these structures. It is not until chapter 4, "Dynamic Allocation" that we see the value of these structures. ATP first explains what dynamic variables are and gives examples on how to use them. This information is found in many programming books and articles but ATP goes one step further, it gives the best explanation of when and why we should use dynamic variables that I have ever come across. The chapter shows how the data structures introduced in the last chapter can be used with dynamic variables to solve difficult programming problems. This chapter also contains a simple but fun program which illustrates how dynamic variables and linked list structures can implement an artificial intelligence application. These two chapters alone are worth the price of the book.

After the reader masters the intricacies of dynamic variables and data structures the book moves into an area that is sure to produce more than a few groans and moans, assembly language and operating system interface. Schildt does a good job explaining a tough subject. After mastering this chapter you'll be able to link an external COM procedure or use Turbo's In-line assembler feature. Once again ATP not only tells us how to do it but also covers why and when it it advantageous to use assembler procedures. My only problem with this chapter is when it says, "To completely integrate the special keys (function and arrow keys) with the normal keys requires writing a special input function and bypassing the normal readln and read functions." ATP then gives a short program "ARROW" that uses an assembler routine to detect when and which special key has been pressed. While this method works you can also use the standard Turbo READ procedure (READ(KBD,CH) and check the ordinal value of ch with ORD(CH). On my Tandy 1000 the up arrow generates a 72 code which is the same as a capital H. If you don't have to distinguish between certain capital letters being pressed and the function or arrow keys you can use the simpler READ procedure, otherwise you will have to use ATPs more complex method.

Chapters 6 and 7 are largely a waste of time in my opinion. Chapter 6 deals exclusively with using statistics with Turbo. Yes, we can write statistical programs using Turbo, does that surprise anyone? If it does ATP devotes one chapter showing you how to do it. There is nothing wrong with any of this material but you could get the same information from any statistics textbook. Chapter 7 covers encryption and data compressions. Maybe I'm way off base here but I just don't know of many readers to whom this will be of much use. In my opinion, this chapter could have been put to better use covering other material (such as using the RS232 or game ports).

Chapter 8 covers random number generators and simulations. Again although this material is informative, how many of us have a real need to write our own random number generator when Turbo supplies one for free? I for one have enough projects to carry me through to the year 2000 without having to reinvent existing procedures.

Chapter 9 returns to more useful topics and explores expression parsing and evaluation. This is another chapter whose examples will find their way into a lot of peoples code, they've already found a home in my library. ATP's provides a clear and understandable explanation of the hideous task of parsing (I personally always called in a stuntman rather than attempt expression parsing myself). This chapter only deals with numeric expression parsing but the techniques can easily be applied to other types of information as well.

Chapters 10 and 11 cover more general topics. Chapter 10 covers converting C and BASIC to Turbo. The only problem with the C conversion is that some readers may desert Turbo in favor of the more flexible C after they compare the languages. As to the BASIC conversion ATP understates the problem when it says, "The translation task is very tricky: generally, it requires extensive knowledge of both BASIC and Turbo Pascal...." ATP provides some good guidelines of what to look for in the conversion but having been faced with this problem in the past I would recommend the programmer determine the functions that the BASIC program provided and design a Pascal program to fulfill those functions rather than attempt a translation of an existing program.

The last chapter deals with efficiency, porting, and debugging. This chapter is a collection of ideas that will help the programmer write a better program. The ideas are sound, if sometimes a little trite, and will produce a better program if the programmer adheres to them.

In summary *Advanced Turbo Pascal* is a valuable, informative book. My only real complaint with the book is that the author could have dropped some of the less useful material (Chapters 6, 7 and 8) and added more valuable material. I was somewhat shocked that the book did not cover the use of overlays and chaining which is a major advantage of the Turbo system but causes problems for many programmers. Also it would have been nice if Chapter 5 had been expanded to cover interfacing to communication devices which is another necessity for many applications but not really covered in the Borland reference manual. Regardless of these areas ATP is well worth the price and I recommend it to anyone who is serious about programming in Turbo Pascal.

*Advanced Turbo Pascal Programming and Techniques*, Herbert Schildt, Osborne McGraw-Hill, Berkely, CA: 1986, 276 pages. ●

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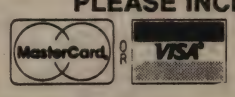

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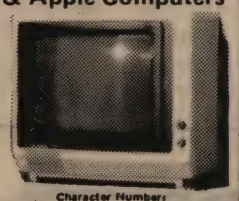

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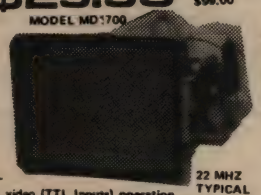

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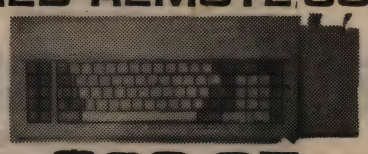

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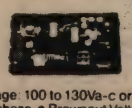

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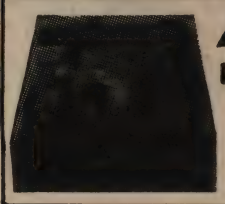

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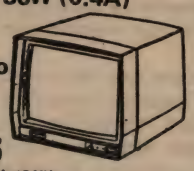

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# Ampro's T-Box

## Kiss Your Telex System Goodbye

by Peter Ruber

During a visit to Silicon Valley this past August, I spent several days at Ampro Computers, talking with their engineers and management to learn what I could about new products in development. As most of you know, Ampro makes those versatile Little Boards, which are, in effect, complete desk top computer systems designed to mount on a disk drive.

I've become quite a fan of the Little Boards, because they represent the best of the new technology of miniaturization at affordable prices. As such, I've managed to network together several systems for the price of one of my Heath/-Zenith or PC-compatible computers.

There are now 9 Little Boards in Ampro's latest catalog, ranging from complete CP/M and PC-DOS single-board computers, to SCSI/IOP that is an inexpensive host adapter whose primary function is to open up the architecture of closed computer systems to that they can interface with external devices. It will allow computers such as the Commodore Amiga, to interface with hard disk drives and streaming tape devices at prices competitive to other systems.

Their newest product is the Video RAM Emulator, which piggy-backs on top of the LB/186 PC-DOS Little Board. This enables the 186 to run such graphic intensive programs as Lotus and Symphony on a variety of terminals from Wyse, Televideo, DEC and Kimtron. Unfortunately, the Heath/Zenith drivers weren't ready for release, when I picked up my board, so I will have to report on a hands-on workout in a future article.

One of the primary reasons for making the 3000-mile cross country trip to Ampro, was to view, firsthand, the final prototype of their 3rd generation Little Board. It will be an all CMOS single-board computer that is so powerful that it required 2 pages of small type just to list the features and specifications.

It's the same size as its predecessors, containing all serial, parallel, floppy and SCSI hard disk interfaces on a four-layer board measuring 5.75" by 8". When it was originally conceived, it was nearly twice that size. But the development of several custom ICs and a new high-powered microprocessor from NEC, has allowed Ampro to shrink the board to conform to the size of their Little Boards.

In addition to their SCSI/PLUS interface bus, the board will also have an IBM bus socket, with a plug-in expansion bus for 1 to 3 IBM-compatible cards. If you plug in an IBM-style keyboard, you will have the smallest IBM-compatible system yet devised. I have no doubts that someone will license this technology from Ampro in order to give the new Zenith laptop portable some distinct competition. Conversely, the board will also interface to most popular ASCII terminals, and can use the new high-density 1.2-MB floppy drives found in the IBM-AT. It will run Unix and Xenix.

At the OEM, VAR, scientific and manufacturing ends, it can operate in a sealed environment for long periods in harsh climates ranging from humid jungles to frozen wastelands. It draws only 1.5 watts of power from a single 5-volt power source.

I am, of course, itching to give you a complete rundown on all the features, the custom circuitry, and the test results of actual use, but I have been sworn to secrecy until January 1987. At that time, the Beta testing will have been completed, and the board will be in production.

continued on page 279


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**Ampro's T-Box continued from page 278**

Between now and then, I will be reporting on several other major Ampro products in the areas of networking and a multi-user system using Concurrent DOS.

In the meantime, I was able to view a new product just going into distribution called the T-Box.

A lot of businesses rely on a Telex machine (as well as a unit called the Whisper Writer) to communicate with their suppliers and customers around the globe. It has been an indispensable alternative to the telephone for several decades, but it is costly, obtrusive and requires a trained operator. The cost of owning a Telex machine can run from $2500 to about $4500. It requires the use of a dedicated line from the long-distance carrier that will cost you $105 per month. In addition, you are also charged for your logon time. Thus, a busy office can rack up handsome monthly assessments.

The Whisper Writer operates much in the same way as the Telex machine does. It's a typewriter console with an attached printer mechanism, requiring the same dedicated telephone line. It costs about $1500. But with the reduced cost of the unit come operational problems—the most notable of which is paper jamming.

Both the Telex and Whisper Writer fall into the category of instant transmission. When you wish to send a message you enter the recipient's code and send a query to determine if, due to time zone changes, the corresponding machine is awake. The code is in the form of numerical digits that identify the country, carrier and recipient. If the printer at the other end jams during your transmission, your machine has no way of knowing this. The result is that your recipient will not have received your message. He will know that he was in the process of being communicated with, but that's all.

In recent years, Electronic Mail has become a popular method of transmitting overnight letters or messages at lower costs than telephone calls. A lot of small businesses who may only transmit or receive Electronic Mail on a limited basis, usually log on to their carrier several times a day via a computer and modem. This requires that one person be assigned to handle this task, during which time the computer is inoperable for other tasks.

Ampro Computers had been using ITT's Electronic Mail service (called Time-Tran) for several years to communicate with their distributors in 12 foreign countries and a growing international customer base. Due to hectic work schedules, it wasn't unusual for the assigned staff members to forget occasionally to access Time-Tran every day. This type of service is called Store and Forward. It simply means that the long-distance carrier's Electronic Mail service stores all messages received, and forwards them upon request.

What they wanted was a device to perform this ritual unattended at prescribed periods throughout the day, have instant backups of all incoming messages stored on floppy disks, along with a simultaneous hard copy printout. They also wanted it to be user-friendly so that any staff member could use it to send messages by merely inserting a floppy disk containing the typed copy. Failure to access one's Electronic Mail service daily could result in lost messages, as most of these services remove messages from their board and store them on a back-up tape system. The only way for you to download copies of missed messages is to contact the carrier and give him the number of the last tranmission you received. Without it, he won't cooperate by sifting through many thousands of messages in order to locate yours. Also, this must be done within a specified time-period, that varies among the carriers, after which messages are erased.

Practical solutions aren't always complicated. Ampro took one of their microprocessor based Little Boards, mounted it inside a single-drive cabinet with a modem board that plugged directly into a telephone line via an RJ-11 plug and a simple "Y"-connector. Since all of Ampro's single-board computers are self-initializing (that is, they load the operating system and

**continued on page 280**


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- Free software from Micropro: Wordstar, Mailmerge, Spellstar, Infostar, Calcstar & Basic.

**MBC 4000 SPECIFICATIONS:**

- MS DOS - CP/M 86 operating system with editor, assembler and all standard utilities.
- 128KB RAM memory capacity, expandable to 640KB.
- Interfaces for one Centronics printer and one RS-232C port.
- 12" no-glare green monitor display screen for easy viewing.
- One (MBC 4000) or two (MBC 4050) internal double-sided, double-density, double-track, 5¼" slim-type mini floppy disk drives with 640KB formatted capacity.
- Keyboard with 15 user-programmable function keys.
- Free software from Micropro: Wordstar, Mailmerge, Spellstar, Infostar, Calcstar & Basic.

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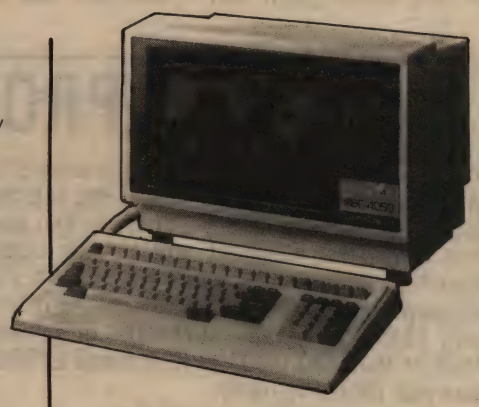

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**Ampro's T-Box continued from page 279**

any software programs through a batch file in the BIOS) it was an ideal marriage for the creation of the T-Box.

A clock-timer was incorporated into the system BIOS, so that as soon as the unit was powered up, it would be ready to perform its assigned task. The terminal program used is MEX, from Night Owl Software, and a driver was written to instruct the T-Box to dial ITT's 800 Time-Tran number every half hour. If the modem receives a Carrier Detect signal from the number it has dialed, the software will transmit the password for the log on sequence, enter the download mode, and capture the files

Disconnecting is also automatic. ITT uses an NNNN.... code to indicate either no messages in storage or the end of a tranmission. The T-Box then shuts down and waits patiently until the BIOS Clock again instructs it to access the Electronic Mail service. The system can interface to any RS232C terminal for a visual display of in coming data. And while in its idle state, a small LED lights every minute on the front panel to let you know that it is functioning.

When I asked Ampro what the cost of this system was in single-user quantities, I was told it was under $1000, but in the large quantities that some long-distance carriers are investigating the T-Box, it would drop as much as 40-50%.

Dave Feldman, Ampro's VP of Manufacturing, who demonstrated the prowess of the T-Box for me, indicated that they were developing a ROM-based version for the long-distance carrier market.

"Firms like ITT, Western Union and RCA, who provide Electronic Mail services, don't want each user calling in every half hour," Feldman said. "You can just imagine the kind of traffic their lines would have to contend with in concentrated markets around the major cities, and in heavy industrial areas such as Southern California or Silicon Valley. Ultimately, they will ask that we provide them with assorted ROM-based versions that will call in once a day, twice a day, every four or six hours, and so forth. The actual frequency of access will be determined by a user's past volume."

Dave Feldman went on to state that the ROM-based versions were only for automatic accessing of the Electronic Mail services. Users would still have the software option available to transmit messages at any time or to over-ride the system if an urgent reply to a recent message was anticipated. User expense is minimal, too. The 800 numbers assigned to Electronic Mail systems means the user isn't charged for the call. The typical connect time charge for downloading with the T-Box is about 38-cents per minute. Even if the system is used 10 minutes per day (a lot of messages can be downloaded electronically in that time span by high-volume users), it still translates to less money per month than a dedicated telephone line for the typical Telex system.

"I expect," he said "that the Electronic Mail services will lease these units to their customers. They're certainly cheaper on all counts. We've designed these units so that they can be tested and serviced in less than 15-minutes, by merely switching components. On systems we are selling direct, we can provide a 24-hour turn-around. But it is very rare for any of our boards to fail. If anything goes, it's usually the disk drives."

Feldman showed me Ampro's Bulletin Board System which acts as a technical support forum, message exchange, and supplies Public Domain programs and software updates for registered Little Board owners. The system has been operating without interruption for more than two years. "Not only are these the original floppy drives, but no one has ever removed the disk. Even though the factory tests each board before sending to us, we place them on a burn-in rack for 48 hours and then hand test them ourselves. Servicing is time-consuming and costly to us during the warranty period, so we prefer to spend a few extra minutes to hand test all I/O ports. That's why we're able to keep our board costs so low. We know the product will last indefinitely. The user wants his board to perform to his expectations, too."

Since a large number of users integrate Little Board products themselves, I asked Dave Feldman if there were any major user-induced failures.

"Occasionally a chip will fail. Not very often, though. Usually someone will reverse the power and ground lines at the power connector. Mind you, this is a keyed connector—a standard plug. The same kind used on all disk drives. But every now and then, after spending several hundred dollars on one of our Little Boards, someone will skimp on spending 50-cents for a plug and solder the power lines directly to the boards. Although our documentation is quite explicit about identifying every input pin on our boards, we've now added a separate sheet illustrating an enlarged power connector to warn people."

T-Box represents the kind of interesting things that are most often created by the smaller, innovative computer firms, who are in a position to move quickly into a new market area.

It has the promise to revolutionize the way we communicate with others in the next town, or half way around the world. I may give up letter writing permanently.

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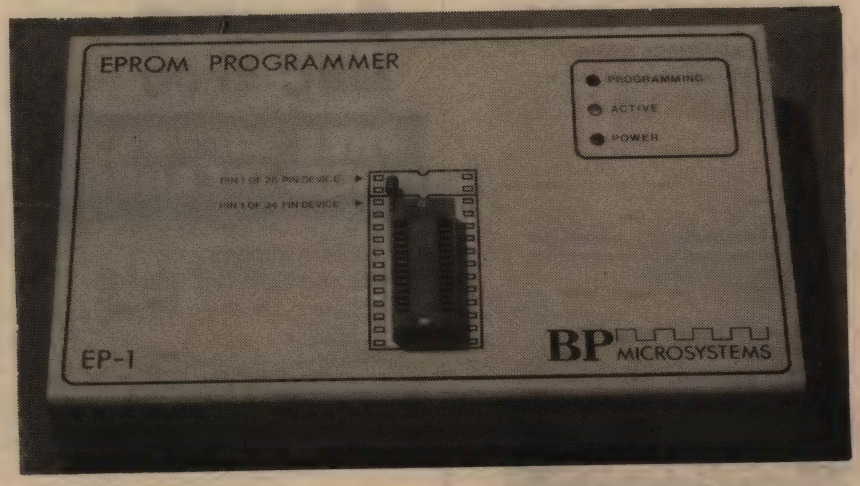


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- Metal case with speaker

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# Wang Announces Ultimate Laptop Computer

Wang Laboratories, Inc. has announced the new Wang Laptop Computer. The new product combines IBM and Wang desktop personal computing in one 14.25-pound unit designed for the mobile professional. It will be sold primarily by Wang's direct sales organization into major niche markets.

Priced at $3,530 and available worldwide in November, the Wang LapTop Computer features the following as standard equipment: a quality, full-sized LCD (Liquid Crystal Display) supertwist screen, built-in 10MB hard disk storage, a full-sized keyboard, built-in communications and printer, and seamless IBM/Wang compatibility using the MS-DOS 3.2 operating system.

While many vendors offer portable computers, Wang's research indicates that most users do not want to sacrifice features simply to have the convenience of a "carry anywhere" unit. The Wang Laptop prevents this from happening; it is a "no-compromise" system for mobile professionals who need office prodctivity tools while away from the office.

Win Burke, Director of Desktop Systems, said, "Industry analysts have long been predicting that the portable market would not take off until price came down and functionality became comparable to desktop systems. That time is now. The Wang LapTop offers the most comprehensive feature set of any products in its class and still can be easily carried. Better still, the LapTop's superior communications capabilities provide access to host systems, industry databases, and peripherals in both local and remote environments."

Distinguishing features of the Wang LapTop Computer include:

- The 8086-compatible 16-bit CMOS microprocessor operating at 8MHz
- 512KB of RAM expandable to 1MB via an optional customer-installable card
- A weight of 14.25 pounds including display, printer, keyboard, Winchester drive, and battery
- A full-sized, 92-key keyboard with 16 programmable function keys, consistent with user expectations for touch typing and word processing performance
- A new supertwist LCD whose resolution is twice as crisp as standard LCD displays
- A built-in, near-letter-quality printer—the Wang LapTop is the only lightweight portable that offers this feature
- A 10MB fixed internal disk, eliminating the need to fuss with diskettes or floppy drives while on the road—the Wang LapTop is one of only a handful of portables that offer an internal hard disk drive; optional 3.5 inch, 720KB and 5.25 inch, 360KB floppy drives for loading application software and off-line storage
- The choice of two Hayes-compatible internal modems: 300/1200 baud and 300/1200/2400 baud—the Wang LapTop is the only portable offering these options
- Access to a complete document creation and routing system with Wang Word Processing, Wang Systems Networking to the VS, and Wang Office
- IBM PC XT compatibility
- IBM color graphics adapter (CGA) compatibility.

The Wang Laptop has it all!

For additional information contact Wang Laboratories, One Industrial Avenue, Lowell, MA 01851; (617) 459-5000.

Mention that you read about it in *Computer Shopper*.

### WANG LAPTOP COMPUTER SUMMARY

| | |
|---|---|
| Processor: | 8086-compatible CMOS |
| Printer: | Ultra-quiet Epson MX-80 compatible printer operating at 18 characters per second in burst mode. Can use plan paper with snap-in thermal transfer cartridge or regular thermal paper. Printing is near-letter-quality at 180 dots per inch. Can be done in background mode. |
| Disk Drives: | 10MB internal half-height Winchester drive standard. Optional 3.5 inch, 720KB battery-powered and 5.25 inch, 360KB AC-powered floppy drives. |
| Speed: | 8MHz |
| Architecture: | 16-bit |
| Operating System: | MS-DOS 3.2, allowing seamless IBM/Wang compatibility, thereby permitting access to both Wang and IBM applications from the same menu. No additional hardware or software necessary to run off-the-shelf IBM applications. |
| Memory | 512KB, expandable to 1MB with customer-installable option board. |
| Screen: | New supertwist LCD (Liquid Crystal Display) that provides twice the crispness of standard LCD displays. Monochrome screen is easy to read (contrast ratio is 7:1), with a resolution of 640x200 pixels to adapt to the IBM color graphics adapter (CGA) standard. Anti-glare screen displays 25 lines by 80 characters. Color CGA applications can run with optional industry standard color monitor or with LCD in monochrome mode. An unlimited number of tilt positions yields a superior display. |
| Modems: | 300/1200 baud internal or 300/1200/2400 baud internal. Accoustic coupler available as an option. |
| Keyboard: | Full-sized 92-key keyboard with Wang/IBM legends. Sixteen programmable function keys. Has industry standard key spacing and sizing in keeping with user expectations for touch typing and word processing performance. Optional numeric keyboard available. |
| Ports: | RS-232-C port<br>Small Computer Systems Interface (SCSI) port supports up to six optional industry standard SCSI devices—the Wang LapTop is the only portable to offer this feature.<br>Monitor port for optional color monitor.<br>Two telephone ports.<br>Numeric keypad keypad port.<br>Serial-to-Parallel adapter as an option. |
| Expanision Slots: | Expansion slot for internal modem.<br>Expansion slot for additional 512KB RAM. |
| Power: | AC current or four-hour rechargable NiCad battery. Optional cigarette lighter recharger. |
| System Card | With battery operated clock. |
| Programming Languages | BASIC Release 3.2 is standard. Others optional. |
| Dimensions: | 13.9" x 11.9" x 4" |
| Shock Resistance: | 70 Gs of force when powered off. |
| Carrying Case: | Lightweight and durable. |

# Forethought's FileMaker

by John J. Anderson

There are a growing number of computer users now accustomed to the Macintosh style of computing. They have awaited software that makes handling their business tasks as simple and rewarding as experimenting with the unique, intuitive features of the Mac.

That is the goal of FileMaker, a file manager program for the Macintosh, under the MacWare label from Forethought. FileMaker takes advantage of the Macintosh's graphics capabilities to help you organize and use information in an easy, effective manner. Your data might be anything from an antique car club's membership list to a doctor's record of patient's visits. FileMaker lets you add pictures and graphic design elements to illustrate your data, does arithmetic for you, and helps you find things quickly. In keeping with the Macintosh's forgiving nature, FileMaker lets you change your mind about how you arrange information; you're never locked into a static format.

If you haven't used other information managers, FileMaker makes it easy to get started by giving you the tools that are familiar on the Macintosh: pull-down menus and dialog boxes for making choices; an undo command for text that you type, and icons that you can understand at a glance. Once you decide what pieces of information you want to organize, FileMaker creates a standard arrangement you can use to add data right away—you can then revise and polish file structure when you're more familiar with the needs of the project.

If you've used other information managers, you'll be relieved to find that FileMaker doesn't restrict the size of fields, records, and files. A text field can hold many lines, even paragraphs of text. The only real limitation is the disk space you have available. FileMaker lets you define calculations and summaries to be automatically performed and updated on the screen. You can add new fields at any time. You can design directly on the screen the way your information will look when it's printed—with no guesswork about where summaries will end up or how columns will be spaced. In addition you can store several different layout arrangements of the same datafiles, so you can print reports, mailing labels, forms, and other documents using the same data. FileMaker also lets you sort data alphabetically, numerically, or chronologically.

You can even find information without deciding beforehand exactly how you're going to look for it—FileMaker indexes every word, number, date and calculation for you. If you use other Macintosh applications to generate or analyze data, you'll appreciate the flexible way FileMaker transfers data to and from other file formats.

Any information that you want to be able to easily update, retrieve according to various criteria, and print in different formats, is a potential FileMaker file. Even information that is not easily categorized—such as research and text information—can benefit from the FileMaker format.

From the layout screen, you can design forms. FileMaker offers point and click tools along the lines of MacPaint to make forms layout accurate and easy. As stated above, you

continued on page 283

# Compaq Introduces Three New Models For Tempest

Compaq Computer Corporation recently announced three additional models of the Loral 3100T Compaq Portable 286, a high-performance portable personal computer meeting U.S. Government Tempest requirements, featuring 360-kilobyte diskette drives and/or 80287 coprocessors.

Additionally, Compaq announced Industrial Tempest program accreditation of the Loral 3100T Compaq Portable 286, signifying the product has passed stringent tests to insure compliance with the Tempest guidelines for suppression of electromagnetic radiation specified in NASCIM 5100A. The Tempest suppression capability is being incorporated in the 3100T Personal Computers through an agreement with Loral Electro-Optical Systems (LEOS), a major electronics equipment supplier to the U.S. Government and Defense Agencies headquartered in Pasadena, CA. Loral will also service the product. As a result of accreditation, the 3100T personal computer will now be included on the U.S. Government's Preferred Product List under Loral Electro-Optical Systems.

"The addition of these models to the 3100T personal computer line enables Compaq to satisfy additional end-user requirements while maintaining Tempest specifications," said Joseph Blog, Director of Government Marketing, Compaq Computer Corporation. "By offering models with 360K-byte diskette drives we offer the end-user greater flexibility in sharing data. To those working in a high-security field who use scientific, engineering and/or spreadsheet applications, the 80287 coprocessor models will offer increased performance."

All models of the Loral 3100T Compaq Portable 286 incorporate: the high-performance 80286 microprocessor; 640 Kilobytes of Random Access Memory (RAM); a removable 20-Megabyte fixed disk drive that allows data to be stored in a physically secure location; an internal fixed-disk tape backup (10 Megabytes per tape); a voltage selection switch for 110V or 220V AC; interfaces for parallel printer and asynchronous communications; and the internal Compaq Dual-Mode Monitor that provides both high-resolution text and graphics. When the fixed disk drive is removed (unlocked), the keyboard is disabled, thereby discouraging unauthorized use of the computer.

Model A, the originally announced model, comes with one 1.2-Megabyte diskette drive and has a suggested resale price of $11,999. The new Model B comes with a 1.2-Megabyte diskette drive, features the addition of an 80287 coprocessor and has a suggested resale price of $12,399. The new Model C comes with one 360-Kilobyte diskette drive instead of a 1.2-Megabyte diskette drive and has a suggested resale price of $11,999. The new Model D, like C, comes with a 360-Kilobyte diskette drive, but features the 80287 math coprocessor and has a suggested resale price of $12,399.

The Loral 3100T Compaq Portable 286 can be ordered through authorized Loral Compaq computer dealers. Authorized Loral Compaq computer dealers can be located by calling (800) 231-0900.

Current options for the Loral 3100T Compaq Portable 286 include: additional removable 20-Megabyte fixed disk drive with protective case, $1,999; MS-DOS/BASIC Release 3, Version 3.1 diskettes and reference guides, $85; XENIX System V/286, as published by Compaq—Base Operating System $599, Software Development System $599 and Text Processing System $199; nylon carrying case, $75; and 10-Megabyte tape cartridges, $30.

For additional information contact Compaq Computer Corp., 20555 FM149, Houston, TX 77070; (713) 370-0670. ●

**Forethought's FileMaker**
**continued from page 282**

can even design multiple layouts of a single file, for different reporting purposes. Images from MacPaint or MacDraw may be imported to the layout via the clipboard. This capability makes designing forms, invoices, and reports as straightforward as possible. You can even lay down text files with data fields to accomplish mail merge functions.

Even after forms have been finalized, you can re-enter the layout screen and modify the form, changing its order, appearance, and field size.

From the "browse" screen, you can find specific records, enter new records, or modify or expand upon older ones. An icon that looks like an open book allows you to move to the first or last, previous or next record in a file. Updates and modifications are registered automatically upon input. A powerful search feature allows you to find exactly the records you seek. It can contain quantity delimiters—for example, you can search for all the sales over $500 to a specific city, or for all the invoices in a specific range of dates.

FileMaker also offers a range of sorting capabilities—in ascending or descending numerical, alphabetical, or chronological order. FileMaker can sort either a group of records found or an entire file.

One of the most powerful capabilities of FileMaker is its *ability* to summarize information in specific ways. This is especially important when making up reports based on FileMaker records. Simply define a summary field, and place it into your form layout.

A summary field can give you a total of, average of, or count of the values in a number field or calculation field over a group of records. A total sums all the values in a given field. An average gives the arithmetic mean of all the values in the field. A count tells you how many records contain a number in the field you specify.

By adding summary fields into separate parts of a record, you can use one field to derive more than one summary, such as subtotals leading to a grand total. The concept of record "parts" is exceptionally powerful, and lends FileMaker a unique advantage over other file management software. The header allows you to insert extra space, text, or other material at the top of every screen and printed page. You can even tell FileMaker to place a page number in the header. The body contains all the fields you have defined, with adjacent layout text corresponding to the field names you defined. One body is displayed for each record, and FileMaker prints as many bodies as will fit on the page. The footer acts in manner similar to the header, allowing extra space to be inserted at the foot of a record layout.

In addition to these, you can add summary parts to any layout. When you want to print one or more summary fields at the end of a report, such as total sales for the quarter by all salespeople, you add a grand summary part. You can choose a subset of records to summarize by first searching for specific records using the find function. For example, a grand summary part could show total sales for all the salespersons who work at a specific branch office.

When you want to sort records by a specific field, then print a summary at the end of each group of records that have the same value in that field, such as total sales broken down by individual salesperson, you add a sub-summary part. You also add a sub-summary part when you want a page break between groups of sorted records.

A host of smaller but no less important features attest to the high level of attention to detail accorded by the programmers of FileMaker. Lines, boxes, and text can be added to layouts directly from within the program. Text and numerical data can be aligned in left, right, or decimal format. Dates can be entered in any of four standard ways, and the program will automatically reformat dates as you desire. For example, FileMaker can take the date 4/1/1986 from a record field and write it out April 1, 1986 in the summary field of a separate layout. Fields can also be repeated in a layout to your heart's content. You can elect to use different fonts, pointsizes, and typefaces in your records. The feature unsort allows you to return to the order in which records were added. Mailing labels are easily handled by a parallel layout. Data can be copied between FileMaker files, and exported and imported to and from other applications. "Cloning" allows you to copy all the field definitions and layouts from a file to another new file, without copying the records themselves. Recover allows damaged datafiles to be reconstructed.

In addition, a special note appeared in our package announcing that MacFiler software was no longer copy-protected. We had no problem installing the program on hard disk, where it operates quickly and efficiently.

The documentation accompanying the package, while as slick and sophisticated as manuals from Apple itself, does not beat around the bush or substitute style for substance. It is clear, well-written, well-organized, and well-indexed. It is spiral-bound, but has a durable hard cover as well.

The number of possible records per file, layouts per file, fields per record, and number of characters per text field are limited only by available memory. Numeric precision is to 16 floating point digits. FileMaker can output to or input from a word processor ASCII text file, a BASIC text file, and SYLK format files. FileMaker lists for $195. A version with even more capabilities, FileMaker Plus, for the Macintosh Plus, lists for $295.

For more information, contact Forethought Inc., 250 Sobrante Way, Sunnyvale, CA 94086. (408) 737-7070. ●


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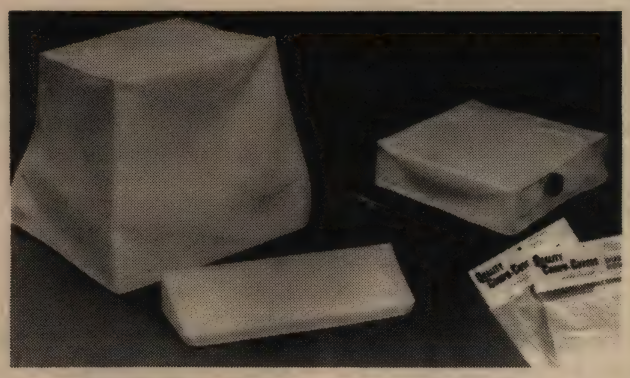

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# Color Separations On Your Apple

by Philip Chien

Color photos (including the front cover of *Computer Shopper*) are printed by a four color process. The color photo is split into four cells, one for each primary color: yellow, red, blue and black. A printing plate is made for each cell, and when the printing presses combine the four print passes together a four color picture is formed.

Color printing of HIRES graphics pictures involves a similar process.. A four color ribbon is used, and performs four passes on each line of graphics producing a color picture. Is there a way we can control this process to perform our own color separations, and save time and money in the process? The Printographer manual gives a hint that it might be possible "By creating four separate versions of PRINT GRAPHICS, each of which only prints the components of a picture within a certain color band.

First we'll need a little primer on how colors are made. If you mix Yellow and Red areas, you end up with Orange. Blue and Yellow make Green, Red and Blue make Violet, and Yellow, Blue and Red all combined together make Brown. When primary colors are combined they produce the illusion of the secondary color, the originals are still there. If you examine your orange area with a magnifying glass, you will notice that it is made of thousands of yellow and red particles jumbled up.

On the Apple the standard HIRES colors are White, Violet, Green, Blue, Orange, and Black. Most Apple pictures are made from those four colors. However, just as crayon colors can be mixed, Apple colors can also be mixed. If you make a checkerboard pattern of blue and Green dots, your picture will look Aquamarine (a fancy name for Blue-Green). Complicating the matter further RGB monitors use the primary colors of light; Red, Green, and Blue differently to create different primary and secondary colors. Naturally, to make things more difficult colors which project light (TV screens) mix differently than colors which reflect light (Printouts). To make color graphics more confusing different names are often used for the same colors. Besides people who refer to Violet as Purple; Red is often refered to as Magenta, and Blue is often refered to as Cyan. Magenta and Cyan are the shades of Red and Blue used for color printing, and as far as this article is concerned, the same. There's just one more quirk to color graphics on the Apple. If you multiply the 280x192 resolution of the Apple's screen by 6 colors and divide by 8 bits per byte, you will end up with a HIRES screen taking up over 40K of RAM! So how does the HIRES screen "only" take up 8K of RAM? A particular dot on an Apple HIRES screen has very limited color possibilities. A dot with an even column number can be Black or Violet, and an odd dot can be Black or Green. If both even and odd dots are turned on, both dots change into White. However—if the high bit of a seven dot combination is set, then Violet changes into Blue, and Green changes into Orange.

Confused? You should be. Apple's graphics quirks have confounded, and confused programmers and graphics artists for the last nine years. The double HIRES mode on the IIe and the super-double HIRES modes on the IIgs just make things more confusing.

Whenever you print color HIRES pictures onto your printer, you should be aware of these limitations. Common results are stripe patterns where you would expect a gray or color area, weird vertical color lines appearing out of nowhere, and incorrect colors. Keeping these limitations in mind, it is still relatively simple to separate color pictures into individual cells.

First: Configure an extra backup copy of your Printographer diskette with your printer setup as a color printer. Even if you don't have a color printer, tell Printographer that you have the color version of your printer (e.g. If you have an Imagewriter I, select an Imagewriter II. If you have an Epson compatible printer, select the JX-80.) Label this diskette color separator. Printographer only operates on standard (single) HIRES pictures, and only in DOS 3.3 at the present, so your picture will have to be a color standard HIRES DOS 3.3 file. A ProDOS version is expected soon, but the Double—HIRES version has been delayed. Hopefully when it eventually does get released it will support the super-HIRES modes on the IIGs also. Boot your modified copy of Printographer, and load your picture into memory. Select print, and you will see the standard: NORMAL INVERSE SET COLORS selection. Select SET COLORS and you will be asked which ribbons to use for each of the Apple's six standard colors.

Here's the tricky part. We're going to dump four copies of the same picture, but we are going to select which parts we want to dump each time (Remember the crayons?) Most color print ribbons use four color bands, Yellow, Red, Blue, and Black (a/k/a Yellow, Magenta, Cyan, and Black). For the first pass (Yellow) we will want to print only the Green and Orange colors. Select 0 (don't print) for the other colors, and 4 (Black) for the Green and Orange sections. Proceed normally, selecting magnification, format, and justification. When that cell has been printed, re-select the same HIRES picture to be printed. The second pass will be in Red, and the Violet and Orange sections will have to be printed. For the third pass (Blue), you will need to print the Violet, Blue, and Green cells. For the last pass (Black) only print the Black areas of the picture. Table 1 shows how primary colors are mixed, and which sections should be printed for each cell. The end result? With the possible exceptions of misselected areas due to color mixing, and unexpected vertical lines due to the Apple's hardware limitations, you will have a color separation ready for the printer!

Diagram #1 shows the popular HIRES shuttle picture, split into its four component cells, and a standard black and white dump of the same picture. Note the extra vertical line on the shuttle's right SRB on the red cell, and the line on the right side of the screen in the black cell. The four cells clearly show different colored areas of the original HIRES picture. The Yellow and Red cells show the launch gantry and exhaust from the main engines. The Blue cell clearly shows the sky, and the Black cell includes the launch platform, shading on the gantry, exhaust from the engines, and the outline of the shuttle. Note that the exhaust from the main engines is primarily Red, and tinged with alternating rows of Yellow and blue.

As long as we are talking about color printing, and Printographer, here's how to configure Printographer to work with the Toshiba P35C.

I reviewed the Toshiba P351 printer in the June issue of *Computer Shopper*, and mentioned that a color version was under developement, is now available. In most cases the Toshiba looks and acts like an Epson/IBM compatible printer, but in other cases strange characters would appear and different looking characters would print. There is another very annoying "feature" on the color version of the P351C. It will not work with ribbons designed for the original P351 and 1351 family. The color carriage will not accept earlier ribbon cartridges, and second party ribbon manufacturers have not produced ribbons for the P351C yet, making them very hard to obtain!!!! A-R-R-G-G-H-H-!-!

Configuring Printographer is just a matter of finding the documentation for how to select the various color bands. A quick look in the user manual shows the commands to select colors are ESC y for Yellow, ESC m for Magenta (Red), ESC c for Cyan (Blue), and ESC b for Black. These are the same commands used in the IBM Color Printer mode. Fortunately even though Printographer doesn't support the P351C, it does support the standard black and white Toshiba printers, and is relatively easy to modify. The trick is instead of creating an information table from scratch for the P351C, we will modify an already existing table for the P1351 (Toshiba's first release in its 24 wire printer family).

Run the Printographer CONFIGURE program on a backup copy of your original Printographer master diskette. When the program asks yo WHICH PRINTER DO YOU HAVE? answer 67 (other printer). Enter the width of your paper (either 8 or 14 inches), whatever interface card you have, and the slot of your printer. The program will ask ENTER PRINTER TABLE NAME. Type: TOSHIBA P1351 TABLE.0 (this is the standard black and white file which we will modify). The program will ask DO YOU WISH TO MODIFY THIS TABLE? and naturally the answer is yes. Choose the defaults for each of the remaining questions (those are the hard ones which tell Printographer how the printer prints.)

Printographer will then configure itself, and be ready to use. Note that the ribbon setup commands are the decimal values for the escape sequences used to select each ribbon color, followed by a carriage return (13). The ribbon values for the colors are exactly the same as the color combinations we use to separate a picture into its component colors, when we separate a picture, we just pick which colors we want manually.

**Products Mentioned**

Product: Printographer
Author: Stephen Billard
Distributor: Roger Wagner Publishing, 10761 Woodside Ave., Suite E, Sante, CA 92071; (619) 562-3670.
Retail price: $39.95
Hardware requirements: Any Apple, any graphics printer
Format: double sided 5¼" copyable disk
Warranty: 30 days
Summary: Excellent versatile graphics program, see May '86 *Computer Shopper* for more details.

Product: Toshiba P351-C
Distributor: Toshiba American Inc., 2441 Michelle Dr., Tustin, CA 92680; (714) 730-5000.
Retail price: $1749
Warranty: 90 days
Summary: Color version of the popular Toshiba P351 printer, see June '86 *Computer Shopper* for a full review of the Toshiba P351. ●

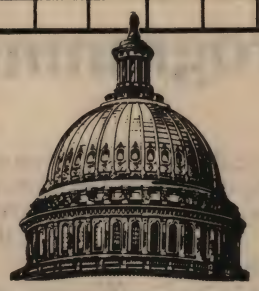
```
DOES YOUR PRINTER HAVE A MULTI-COLOR RIBBON? Y
HOW MANY COLOR BANDS ARE THERE? 4
ENTER RIBBON ONE SETUP: 27 121 13
ENTER RIBBON TWO SETUP: 27 109 13
ENTER RIBBON THREE SETUP: 27 99 13
ENTER RIBBON FOUR SETUP: 27 98 13
ENTER RIBBON VALUE(S) FOR BLACK: 4
ENTER RIBBON VALUE(S) FOR VIOLET: 2+3
ENTER RIBBON VALUE(S) FOR Blue: 3
ENTER RIBBON VALUE(S) FOR Green: 1+3
ENTER RIBBON VALUE(S) FOR ORANGE: 1+2
ENTER RIBBON VALUE(S) FOR WHITE: 0
```

Table 1:

Yellow + Red = Orange
Red + Blue = Violet
Yellow + Blue = Green
Yellow + Red + Blue = Brown

| | Yellow | Magenta | Cyan | Black |
|---|---|---|---|---|
| Black | | | | X |
| Violet | | X | X | |
| Blue | | | X | |
| Green | X | | X | |
| Orange | X | X | | |
| White | | | | |

Diagram #1: Four cells separated from a color HIRES picture
Diagram #2: (hopefully) The original color picture



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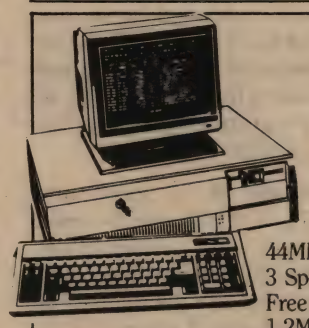

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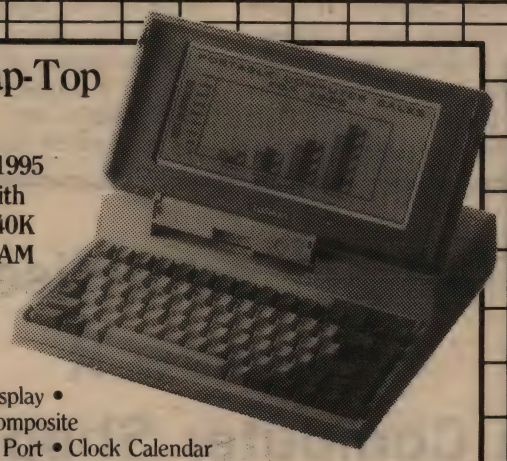

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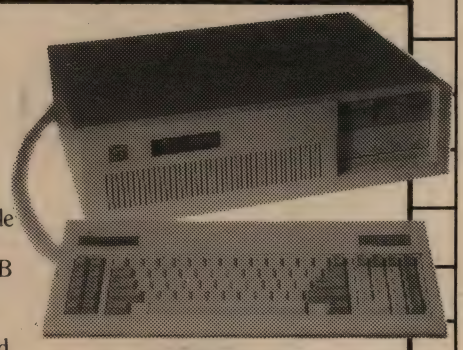

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# Demo-Maker: The Art of Vaporware Programming

by Hal Nieburg

Main Street is an old western town, but it is all a fake. It is only a movie studio set, realistic facades with nothing behind them but a criss-cross of lumber, and nearby the dusty streets of Hollywood. Here is a piece of software for building such false fronts for computerware.

"It is probably unlike any other program that you have used" says the run-time slide show which comes with the program. And that is the simple truth.

Programs created with Bricklin's new release DEMO acquire enormous versimilitude. The screens pop-up crisply and convincingly, with realistic menus, highlight bars that move to the user's selections, sequences and actions that for all intents and purposes act exactly like the real thing. But, no real functions are performed and there is no program code to support the indicated functions...

The program permits drawing screens and linking them together through simulated commands, looking all the world like a real heavy duty program doing its thing. But in fact the program does nothing.

What is this about? Who needs to build phony software, programs that only appear to be real? On the first blush, the software appears to be a prank. Indeed, many can use it this way. But once you have seen and used this package, you will wonder how you ever managed to be without it. It is Dan Bricklin's special gift to invent the unexpected, which then proves to be as invaluable as it is improbable.

Who can use a program that makes it so easy to create convincing, but empty, shells of programs? Lots of people!

Most important, DEMO permits rapid "sketches" of proposed software, which can be worked over quickly and easily, before investing thousands of man-hours in developing the actual code. Minutes, instead of hours, are all that are wanted to come up with screens, with moving and interactive features in place, of new program ideas. Great for early design work.

Because of its speed and facility, DEMO can be used not only for preliminary designs, but also for free form exploration and discovery, like the sketch pad of an artist. Programmers can sit and play with the most impractical notions, out of which may come some of their most original ideas. Indeed, it is this kind of spontaneous play that probably inspired Bricklin to develop this particular product! The terra incognita of future software can be explored instantly and cheaply. A programmer can have an idea while jogging and test it out after he gets to the keyboard before the sweat dries on his head band.

Reverse engineering is facilitated. Software designers can now work backwards, creating and testing the feel and appearance of programs, trying them out on naive users, making quick revisions and extrapolations; polishing the user interface, and permitting the users to better communicate their requirements back to the programmer before the ink is dry on the contract. Then the job of writing and compiling code can be accomplished.

So simple to use, even non-techie users can create "slide shows" and story-board presentations for a wide variety of purposes, such as display of instructional or sales messages, testing different colors and simple graphics to achieve the most smashing results.

DEMO can be used in the same way to create interactive tutorials to teach new software (or any software for that matter). This can be especially valuable for proprietary software, where a program is tailored to a specific job and user. In the past, it often did not appear worthwhile to write self-administered tutorials for dedicated programs; now that consideration is removed since it can be done so simply and cheaply.

Different layouts can be tried out to achieve customized functionality and uniqueness.

Simulating software that hasn't been developed is a good way of convincing investors that the code should be written in the first place. The money bags can actually see the finished product, even though it hasn't been written yet, and do not feel they are whistling in the dark.

No doubt other uses will also be found for a program at once so weird and so interesting!

### How Does It Work?

DEMO turns an idea into a real-time program. It allows you to create, edit, and view a series of slides, each of which can then be slipped into a run-time program that animates the series, giving the appearance and user-control of an actual program. The series can run automatically or interactively.

As the simulation runs, customizing touches are added to give the show a live feel; the cursor flashes as input is "typed," and the disk drives spin as if loading or reading.

Bricklin provides a demo of DEMO, a word processor that on command will translate text from English to French. He is able to create an "actual working model" that does in fact appear to accomplish this chore, showing the front end and "working" hot keys. This was written in less than one hour, to demonstrate how easy it is to simulate functions which, in reality, would take years of code-writing to achieve.

When you first start the program, the screen is blank except for a large cursor, controlled by the cursor arrows in the upper left corner. Tab stops can be set both vertically and horizontally, to ease creation of screens. Like other text editors, you can type in characters, toggle between insert and overwrite, correct errors, etc. But that is where the resemblance to a text editor ends.

Graphics, inverse video, lock moves are possible for each screen, and the screens can be laminated into a series, responsive to user keystrokes. For example, a pop-up menu can be created with three user options. The titles and options are entered as text. By hitting F3, we switch to the line-drawing mode and, using the cursor arrows, we easily draw a decorative box around the words, and, by punching F9, the box is marked and can be moved to an appropriate pop-down position.

The basic screen is copied into three screens (by punching Shift-F5), all alike except that each has the highlight bar on a different choice. Other particular display attributes (all 256 are available at the touch of a function key) are added. As we do these things, a small window opens with a list of the various commands we may employ to complete the task. Figure 1 is the line drawing box.

We can create as many screens as there is room on the disk (each one takes about 30K), thus animating major or minor screen modifications and transformations, illustrating without working model of software as many complex branching operations as the programmer's mind may imagine. Figure 2 is Bricklin's diagram of this function.

Switching between slides, back and forth, happens very smoothly, so that the switching itself is imperceptible. Only the screen activity, the function of the psuedo-program, is seen.

All the animation creation functions are assigned to the 10 function keys, greatly speeding the use of the software, and an excellent help facility is always available by evoking the main menu which looks like Figure 3.

After creating all the screens, you can rearrange their order by editing a list of all the ".DBD" files, thereby controlling the playback of the animation, either automatically, as in a slide presentation, or in response to user commands, as in a software simulation.

### Conclusion

As Bricklin points out, DEMO is actually "a very general purpose tool," for a wide variety of applications. Its simplicity of operation makes it appropriate for many inventive uses. One company is using it to put comments on spreadsheets that are passed from office to office. Other use it to mock-up printed reports. Taking advantage of the ease of drawing lines and boxes, it can be used to create hard copy forms, as a note taking editor, as a method of creating animated messages among networked computers or E-Mail.

Bricklin has done it again! His DEMO (which should have been named DEMO-MAKER) is a natural and will, I am sure, be with us now in ever-more powerful versions as long as computing remains a feature of the human way of working. Originality and functionality guarantee it a rapid rise to classic status.

DEMO
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FIGURE 1

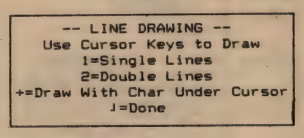



FIGURE 2

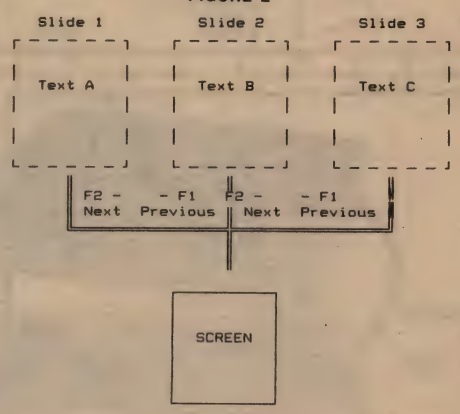
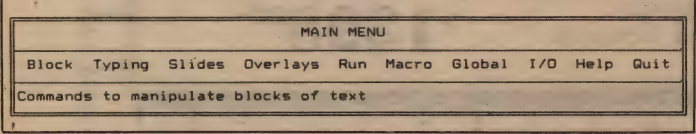



FIGURE 3

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# "Practical Printer Tips"

by Fred Blechman

I've had over a dozen microcomputer printers in the last few years, and here are some ideas I've heard about or developed to make things easier. You might not be able to use them all but even one of these tips could save you a lot of time, trouble or money.

**The Advantages of Roll Paper**

Have you considered using roll paper with your printer? Many of the early microcomputer printers offered only friction-feed for roll paper or single sheets, and came with roll paper holders. Today most printers include tractor-feed for fan-fold paper and ignore roll paper entirely.

If you have a printer that only has friction-feed, with no tractors or pins on the platen to fit pin-feed paper, you can only use single-sheets or roll paper. The main reasons most computerists don't use roll paper are: the possibility of less accuracy in line spacing; the curl that results from the paper being wound on a roll; the non-specified sheet length; and the inconvenience in folding.

However, modern friction-feed mechanisms are quite accurate in line spacing, so that's no longer a valid problem except in precision work. The paper curl is easily removed by reverse-rolling or running the paper backwards over a table-edge. A standard, inexpensive paper cutter trims the paper accurately to any length, not just the 11-inches usually provided with fan-fold paper. And accordion-folding roll paper is really very simple, with the advantage of being able to fold it to any size.

Most printers have a paper tear-off bar above the carriage, so you can tear roll paper at any convenient point. I find this particularly useful when printing just a few labels, or doing text or graphic screen dumps. I hate wasting paper and having to constantly move fan-fold paper up to the next sheet to start printing!

It's also useful when telecommunicating to print everything that comes in over the modem (since input can scroll up off the screen before you can read or understand it). Save only what you wish to, without respect to fan-fold page length or horizontal perforations. With roll paper you never have to worry about form-feeds or special programming to avoid printing perforations.

Roll paper is much easier to load into the printer mechanism, since there are no holes to line up, and there is nothing to tear off the sides of the finished document. Also, since nothing is torn off the sides, roll paper sides are smooth, which is only available in fan-fold if you buy the more expensive "microperforated" or "laser-cut" paper.

Another advantage of roll paper is that you don't need to use a lot of space (or buy an under-the-printer platform) for a stack of blank paper. Roll paper holders, which used to come as standard equipment with some OKIDATA Microline and Star Micronics printers, extend only a few inches behind the printer.

If a roll paper holder didn't come with your printer, it's easy to make your own from heavy wire or wood. See Figure 1 for a sketch of one I made from a piece of pine shelving. Not fancy, but it works great! Press a thumbtack into the bottom of each slot, to act as a hard bearing surface. The dowel I used as the paper roll axle was part of a broom handle. I rubbed it with candle wax to reduce the friction, allowing the roll to rotate and feed paper easily. I don't know anyone who sells roll paper holders for personal computer printers. Could this be an opportunity for one of you entrepreneurs?

Does this all mean I use roll paper exclusively? No. When I have a long multi-sheet printing job (such as a magazine article), I use fan-fold paper. But for routine, non-critical work I use roll paper and have roll holders on all five of my regularly-used printers.

Roll paper (frequently referred to as "teletype" or "teleprinter" rolls) is not used much anymore, so it may be tricky to locate. Many computer paper supply houses still carry it. The price is now higher than fan-fold paper—about $6 for a 300-foot 8-½ inch wide roll, which is equivalent to about 325 11" sheets. Stationery stores sometimes have these rolls, but usually at higher prices. Be sure you specify "bond" and not "groundwood," which can be rough on the pins of dot-matrix printer heads.

I get my roll paper a case at a time (12 rolls) from a mail-order dealer, Alpha Computing Supply, 9625 Mason Avenue, Chatsworth, CA 91311 (818) 882-9818. Call them for latest prices and delivery.

Another source for roll paper is printing shops. They use large rolls of 8-½ inch wide paper, and some will sell leftovers for much less than regular prices. They even have wooden plug adaptors that push into their 3-inch diameter core to accommodate the nor-

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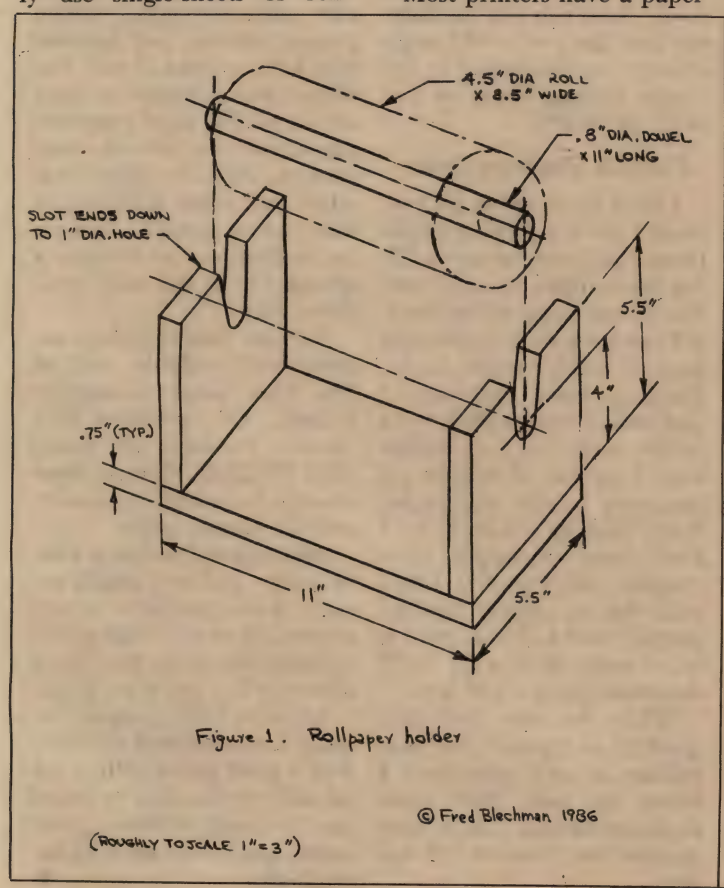


Figure 1. Rollpaper holder

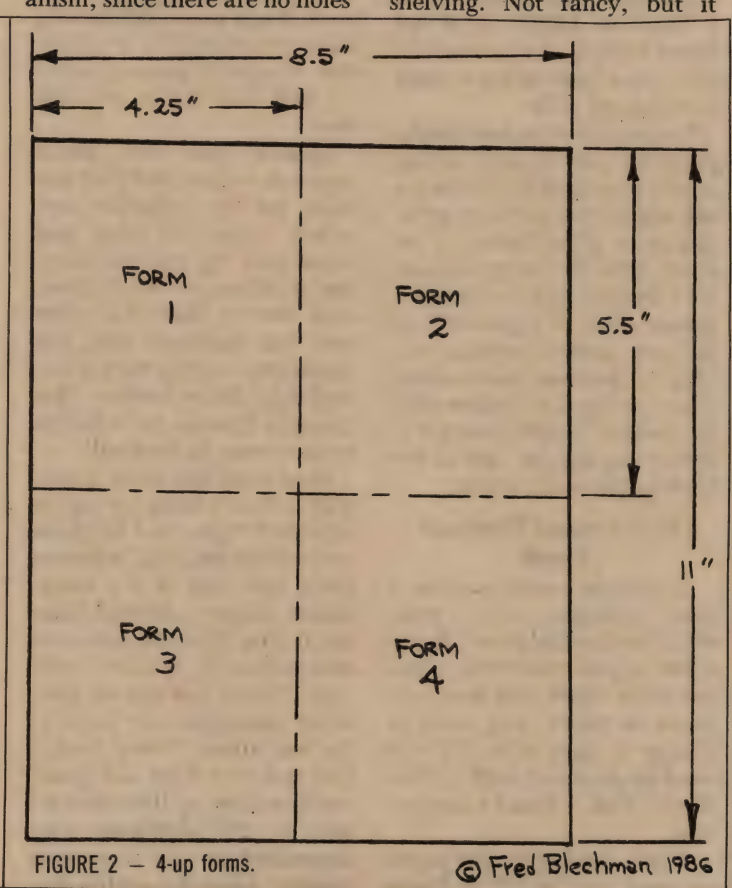


FIGURE 2 — 4-up forms.

# Write, A CP/M Word Processing Program For Creative Writers

by Charles Barton

The CP/M computer is still an excellent instrument for word processing. Although our CP/M word processing programs cannot compete feature by feature with the best MS-DOS word processing programs, we can still duplicate everything that can be done with a MS-DOS word processing program through use of word processing utilities. Word Plus is an outstanding example of what can be done with CP/M word processing utilities. The real virtue of CP/M as a word processing medium is that it forces on programmers the necessity of adopting an elegant structure and good coding techniques for their programs, rather than relying on CPU brute force to process massive amounts of code. But most full scale CP/M word processing programs do not rely on elegance alone to compensate for limited memory. Many

WordStar commands reside in disk bound overlays rather than in computer RAM. Every time the WordStar user needs a disk bound command, he has to wait while the command is accessed from the disk. In addition, WordStar automatically places part of long files into disk bound virtual memory further slowing operations. These two factors make serious writing with WordStar more of a chore than I would like. The command structure of Perfect Writer is even more complex than WordStar without overlays, but Perfect Writer requires separate programs for formatting and printing. In addition, Perfect Writer keeps most working files in Swap files. In my experience use of Perfect Writer is limited by its frequent disk swaps.

A RAM disk can do wonders for speeding up writing with WordStar or Perfect Writer, but it can't solve all of the problems associated with these word processors. Both programs have very complex command structures, often requiring several keys to be pushed in order to issue a command. And while memorizing the commands is not as difficult as memorizing the *Encyclopedia Britannica*, it has been enough to cause more than one secretary to have a nervous break down. And if the commands structure isn't formidable enough, editing text with either word processor is a pain for anyone who likes to work with neatly formatted texts. Both WordStar and Perfect Writer are messy to edit because neither automatically reformats. WordStar can be reformatted manually, but this requires several separate commands and is complex in operation. Perfect Writer's lack of on screen reformatting can also be overcome at the cost of constantly issuing commands to insert and close insertions.

Fortunately not all writing requires word processing programs as complex as Perfect Writer or WordStar. Perhaps the best simple CP/M word processor for creative writers is WRITE from Workman and Associates. Everyone who reads Jerry Pournelle's column in *Byte* knows about it. The main reason Dr. Pournelle has stuck to his CP/M computer is because WRITE is not available for MS-DOS computers. Is Dr. Pournelle crazy, or is he on to a good thing?

WRITE is a relatively small program for word processing, requiring only 21K memory. It has some small overlays, but they are never used in editing, writing or printing. The basic program and current text reside in computer RAM. Because of its small size, from 34K to 38K of computer RAM is available for a text file on most 64K CP/M computers. WRITE does not extend files into CP/M virtual memory. Since editing, formatting and printing commands are all available in RAM at all times along with the text file, most word processing operations are very fast. Needless to say we are dealing here with some extremely clever coding. Most edit commands require only a single control keystroke to actuate. WRITE only has 30 commands in the edit mode. Yet the command structure is so well designed that you can use them to do virtually everything that the edit commands in WordStar will do and then some. Even a poorly designed terminal can be configured to use most WRITE commands without control keys. Kaypro CP/M computers already provide keys for 8 WRITE commands, and the numeric key pad can be configured for the most used 14 commands. I find that I seldom need the other 8 commands.

The structure of edit commands is very good. One key is used for both search, and search and replace. WRITE does not provide single key commands for next and previous sentences, paragraphs, and screens, but these commands are available in relatively simple Macros. If "0" is typed after entering a scrolling mode, then scrolled takes place one screen at a time by using the forward and reverse scrolling keys. (This is another example of clever coding.) The search command can be employed to move the cursor by sentences or paragraphs, by looking for the previous or next period or carriage return. And a single key moves the cursor to the beginning or end of a line.

One of the most pleasant features of WRITE is the automatic reformatting during editing. This is accomplished by an unusual text feature, the absence of carriage returns between lines except at paragraphs. On Screen formatting does not require carriage returns, thus WRITE paragraphs texts will look to other Word Processors like single, very long lines of texts. This form of text will drive CP/M type commands crazy, but if you have a little of the sadist in you, try it sometime. To make this text usable with other word processors, Workman and Associates have provided a

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Practical Printer Tips continued from page 287

mal 1-inch computer printer core size.

### OOPS! Defeating the Out-Of-Paper Switch

Do you have a problem using single sheets, such as letterheads, because the printing stops a couple of inches from the bottom? Most printers have a built in OOPS—Out Of Paper Switch—to prevent the print head from trying to print on the hard roller.

Unfortunately, many designs place the end-of-paper-sensor in such a position that there are still one or two inches of printing space at the bottom of the sheet. How do you get around this? Simple! Just put another longer piece of paper behind the one you're printing on. This is another convenience when you have roll paper with its "endless" length; no OOPS, and it can also be used as the backup for single sheets.

### Do-It-Yourself Duplicate Copies

Duplicate copies can be a real problem with non-duplicate fan fold paper. If you want copies sometimes, and not other times, you need two kinds of paper, and have to change it each time. Or you need single-sheets with carbon paper. Yuk! I found a simpler way.

Find a local print shop paper supplier (see the Yellow Pages of your phone book under Printing Supplies) and buy a couple of reams of NCR (trademark of NCR Corp.) paper. This is also sometimes called "no carbon required" paper. Also buy the special fan-apart chemical adhesive. The paper comes in two, three or four-parts, with different colors of paper and blue or black print. Each ream (500 sheets) is also pre-collated in reverse so that it collates properly after it's run through a printing press.

Making your own blank copy-sets is easy, but first you must get the collation corrected. Open the ream and move each top colored sheet, one at a time, to the bottom, until the top sheet is a white one. For duplicate sets, this means only moving the top colored sheet to the bottom. This instantly changes the collation from reverse to forward!

Now stack the ream neatly with a heavy book on top to squeeze it tight, and brush on some of the chemical adhesive along one end of the stack. About fifteen minutes later you'll find that the chemical automatically bonded only "sets," since the top of each white sheet does not bond to the one above. Pretty tricky. You will now have 125 quadruplicate sets, or 166 triplicate sets, or 250 duplicate sets, depending on the paper you bought. Most dot-matrix impact printers can handle triplicates without a problem.

A ream of 8-½x11 inch duplicate NCR paper is about $5, which therefore costs you about 2-cents a set for the paper. Unfortunately, you must initially buy a quart of the chemical adhesive for about $6—but there's enough there to last for 100 reams or more. Now you can use these sets just like you would single sheets— remembering to use longer backup sheets so you don't go OOPS!

### Four-Up Duplicate Forms

I get a lot of orders for products I sell so I wrote a simple invoice program to use in filling these orders. Usually only one or two items are ordered, so I saw no sense in sending out huge 8-½x11 invoice forms. Using a word processor, I designed an invoice form 4-1/4 inches wide by 5-½ inches high. I ran four of these on my computer printer and pasted them "four-up" on an 8-½x11 inch sheet of paper as a "master." See Figure 2. I then took this to a local "instant printer" and had him print it on a ream of 8-½x11 NCR duplicate paper—250 sets.

When he cut this into quarters to separate the four invoices on each large sheet, I ended up with 1000 small duplicate invoice sets, at one-quarter the price of full-size sets.

I simply put these in my printer (with a backup sheet, of course, to defeat the OOP-switch) and use the 16.5 characters-per-inch font of the printer to get as many as 64 characters on an invoice line.

### Recycling Your Ribbons

It has always seemed to me to be terribly wasteful to throw out perfectly good fabric printer ribbons just because they have run out of ink. The ribbon and cartridge or spool are by far the most expensive parts, since the ink only costs pennies. Also, it seems that when you want a ribbon, it takes days or weeks to get them by mail order—or it takes a special trip to the local computer store.

Various fabric ribbon reinkers are available, such as The Mac Inker (Computer Friends, 100 Northwest 86th Avenue, Portland, OR 97229 (503) 297-2321). Contact them directly for models available, and the current price.

Although the process is a little messy and you might get some of the special computer printer ink on your fingers, it's certainly handy to have good ribbons when you want them.

Amway's LOC (Liquid Organic Concentrated Cleaner) does a good job of getting the ink off your hands. I've found my re-inked ribbons print darker and last longer than the originals. ●

# Quality
# IBM COMPATIBLES

## XT BASE SYSTEM

- (2) DS/DD Disk Drives
- Keytronics Keyboard
- 256K RAM
- 150 Watt Power Supply
- TTL Monitor
- Monochrome/Graphics Adaptor
- Parallel Port

**$499**

## XT TURBO

- (2) DS/DD Half Height Drives
- 150 Watt Power Supply
- XT Style Keyboard
- 640K RAM
- Monochrome TTL Monitor
- 1 Year Parts & Labor
- Serial/Parallel/Clock/Game
- Mono/Graphics/Parallel Adaptor

**$679**

## AT TURBO

- 1.2 MB Floppy Disk Drive
- 200 Watt Power Supply
- Monochrome TTL Monitor
- 1 MB Memory on Motherboard
- AT Keyboard
- Mono/Graphics/Parallel Adaptor
- 1 Year Parts & Labor

**$1295**

## XT Options

| | |
|---|---|
| Color System Upgrade | $280 |
| 20MB Hard Disk Kit | $395 |
| 33MB Hard Disk Kit | $465 |
| AT Keyboard Upgrade | $20 |
| 5151 Keyboard Upgrade | $30 |

## AT Options

| | |
|---|---|
| 20MB Seagate 4026 | $525 |
| 40MB Seagate 4051 | $725 |
| 20MB Irwin Tape Back Up | $395 |
| 10MB Irwin Tape Back Up | $365 |
| Color System Upgrade add | $280 |
| 30MB Seagate 4038 | $625 |

## "Build Your Own"

| | |
|---|---|
| AT Keyboard | $52 |
| Mono/Graphic/Parallel | $62 |
| Color/Graphic | $55 |
| XT Keyboard | $46 |
| Turbo Motherboard | $99 |
| 640K RAM | $65 |
| Floppy Drive Controller | $30 |
| AT-Turbo Motherboard | $425 |

## Peripherals & Accessories

| | |
|---|---|
| XT Case | $30 |
| AT Case | $69 |
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| 150 Watt Power Supply | $55 |
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# The COMAL Corner

by Frank & Melody Tymon

### Introduction

The Christmas season belongs to the children, and children love games. So we take this opportunity to generate a simple game for the youngsters, from ages 5 to 80. Fortunately, COMAL easily supports such activity.

(That's my old man at the upper end of the age scale!)

Absolutely no respect for her elders!

For lack of a better title we call the game "Homesafe." The player is called upon to assist Tom-Turtle in getting home. Sounds kind of simple, but beware. The path is strewn with turtle-blocks. As every turtle knows, turtle blocks are the bane of each homeward-bound turtle. In fact, if Tom-Turtle runs into a turtle block, the game comes to a screeching halt.

Evading turtle blocks should be simple, right? Wrong! Turtle blocks are scattered in a random pattern between Tom-Turtle and home. And only you, with your trusty joystick, can guide him safely to his haven.

Essentially we try to move our turtle through some troubled territory in this program. We splatter a variety of blocks randomly over the screen, with one black block as Tom-Turtle's happy home. The turtle is moved using the joystick. With luck and skill we easily reach the selected block—sometimes!

Tom-Turtle is a helpless type at times. He knows where his hutch is located, but navigating safely home is beyond him. (Reminds me of my co-author at times.) Eh, anyway he cannot go home across the endangered battlefield without your assistance. It is your duty to guide him safely to his abode, avoiding the numerous colored blocks blocking his way. If poor Tom-Turtle strikes any colored block (except for the black one)—ZAP! TURTLE SOUP! As you can plainly tell, Tom-Turtle is very anxious for you to do your best.

### The Program

Our process starts off by calling on a procedure, INSTRUCTIONS, which provices guidance to the player. Then, as usual, we bring on an initialization routine, called Housekeeping. This routine contains code much like we have used before in our earlier columns.

In Housekeeping we set up with USE SYSTEM, USE TURTLE, USE JOYSTICKS. We then do a RANDOMIZE, and provide for a full screen of display.

However, before we perform this function we introduce the situation to our game player, using the procedure "leadin." This gives a summary of Tom-Turtle's problems. We follow this with "instructions," spelling out how to play the game.

There are several supporting routines in the program. "Pause" provides for delaying action until the player can, for example, read the instructions. "Hues" allows the program to recognize color names, so that a programmer doesn't have to remember a bunch of numbers.

The workhorses of the routines, however, are "draw'-it," "block," "blackout," otherout, and squares.

### BLOCK

In this procedure, BLOCK, the program does a couple of things to us—or for us, depending on whether we are turtles or not. First, it draws a block which is our friend Tom-Turtle's dwelling place. Following this it rapidly fills in the screen with 50 blocks located randomly.

Actually, the routine doesn't really do the drawing. It sets up the locations and colors, and then calls on "squares" to draw on the screen. In selecting the color we choose from a random selection extending from white to light grey. This constitutes a spectrum of 15 colors.

The blocks drawn here are small and widely dispersed to block any direct path between Tom-Turtle and his old stomping grounds. (Have you ever seen a turtle stomp?—it is exciting!) Anyway, the routine peppers small colored blocks at unpredictable locations over the screen's surface. The blocks are drawn using the "draw" instruction, which draws to a displacement from its current position. We then fill the square with color; using, oddly enough, the "fill" statement.

The DRAW'IT process allows the Tom-Turtle to be moved in fixed increments in the direction selected by the player using the joystick. The size of increment is established by the choice of skill level provided for in the instruction section. At a low skill level, the increments are small, and the game is easier to win. At level 5 the increments are 5 in length, and winning is markedly more difficult.

Within "draw'it" the statement setheading establishes in which direction old Tom is going to move. And "forward" establishes how far he will go with each tremendous turtle leap. Selection determines whether he has arrived home; or, horror of horrors, has touched a forbidden block! The other instructions are self-explanatory.

If the player succeeds in reaching the black block, without Tom-Turtle touching any of the colored ones, our program executes BLACKOUT. Otherwise, if we strike a colored block or go off-screen, it ends up at OTHEROUT. In the first case the player is a hero. In the second case, yuk!

BLACKOUT, as an attention-getting device, flashes the screen on and off for 50 cycles. Then, using TEXT-STYLE and PLOTTEXT, it prints out the banner, WELCOME HOME, Tom-Turtle! In, of course, super-collosal size letters!

OTHEROUT, on the other hand, clears the screen and displays the entry, SORRY! What more can one say, with the demise of poor old Tom-Turtle.

No big, unusual programming tricks. Just methodical, COMAL—easy routines which get the job done.

This little game requires a good deal of dexterity to win, especially at the higher skill level, where our Tom-Turtle races (?) madly along toward home. The game also is the potential starting point for other versions, which could be used later as we expand our repertoire of COMAL skills. For now, however, here is the program! See page 291. ●

# *Artificial Intelligence: How Machines Think*

Reviewed by Michael A. Banks

Are computers self-aware? Do they think, as humans do? Or do even the most sophisticated computers simply follow their programs in the same manner that a toaster or an automobile engine performs its functions, without an "awareness" that they are doing anything?

*Artificial Intelligence: How Machines Think* addresses these concerns, and more. This is perhaps the first really in-depth treatment of Artificial Intelligence for the lay reader. F. David Peat, consultant on various levels for Canadian government and industry, takes the reader on a grand tour of Artificial Intelligence in his book, and to good effect.

Artificial Intelligence (or AI, as it's known to its practitioners) is still the hottest technical topic of the eighties. Book publishers and the popular scientific press are giving this discipline as much attention as robotics (an allied field) and communication, and AI conferences are proliferating.

Why all the interest? One reason is the fact that AI has evolved to the point where there are practical commercial and professional applications for it. "Expert systems"—programs with large, specialized data bases that can communicate with human users and actually apply their expert knowledge to problems—are now sophisticated enough to advise and aid their human counterparts. A highly visible AI application is medicine, where expert systems such as MYCIN diagnose illnesses and recommend treatment. Expert systems serve other branches of science as well, many in direct commercial applications. Prospector, an expert system that helps geologists in mineral exploration, is probably the most spectacular commercial success in AI to date; in 1982 it was used to search for molybdenum deposits in Washington state and located a find worth nearly $100 million. Other expert systems perform translations, extract meaning from documents, and aid in chemical analysis. There are even expert systems that develop computer programs and design other expert systems. Peat introduces the reader to these and several other systems, as well as to AI-related developments in robotics.

Peat does not restrict his coverage of the AI universe to simply displaying wonders, however. As an aid to the reader's understanding of the potential for and limitations of AI research, there is much information on the history and evolution of AI. Ancient legends of "living statues," as well as the thoughts of more modern thinkers such as Nikola Tesla on machine intelligence are examined. There is also an advanced tutorial on the logic and mathematics involved in human and artificial intelligence. Finally, the workings of the human brain—everything from how we approach problem-solving to how we handle language—are examined.

Communication, it turns out, is one of the real boondoggles in AI research. Certainly, computers can manipulate words and concepts, most often as numbers. But dealing with the subtle nuances of meaning that are inferred by a human listener, or implied by a human speaker, are another matter. Systems that parse, or analyze, sentences for meaning are of utmost importance to AI researchers, and some very sophisticated parsers have been developed, enabling the computer to analyze news reports and extract meaning, and to translate from one language to another. (The quality of translation has not been astounding, however.)

As important as communication is, the core of AI research is the problem of getting machines to **think** like humans. Computers can mimic **some** human thought processes, and can even learn, but no computer has yet been able to perform like the human brain in all respects. As Peat suggests and the evidence of research confirms, this is mainly because of the fact that we do not ourselves understand how human thought processes work.

Still, the future of AI is a bright one, and more commercial applications lie on the horizon. AI research continues on many fronts, as researchers investigate how machines and humans understand language, solve problems, interact with the environment, and perceive themselves. In its final chapters, the book takes a peek into the future of AI, and examines some of the social and ethical issues raised by the advent of intelligent, self-aware machines.

*Artificial Intelligence: How Machines Think* offers an entertaining and understandable tutorial on the theory and evolution of machine intelligence. Along the way, Peat provides fascinating glimpses of some of the AI systems currently operating, and uses interesting anecdotes to present some of the more important elements of AI research. Virtually the only thing missing from this book is a good index. This is an engrossing book, one for the serious student of science as well as the casual observer.

*Artificial Intelligence: How Machines Think*
F. David Peat
Baen Books
260 Fifth Avenue
Suite 3-S
New York, NY 10001
$8.95 ●

## Homesafe Program in COMAL

TYMON

THE BIG PROGRAM

```
0010 // delete "0:homesafe.com"
0020 // save "0:homesafe.com"
0030 //
0040 // version 2 - 86/10/05
0050 //
0060 // next lines show revision date/purpose
0070 // 86/08/20 - cosmetic + revision data
0080 // 86/10/05 - convert to magazine-oriented format
0090 //
0100 lead'in
0110 pause(5000)
0120 instructions
0130 hues
0140 housekeeping
0150 block
0160 draw'it
0170 END
0180 //
0190 PROC housekeeping // gets us ready
0200   USE system
0210   USE joysticks
0220   USE turtle
0230   graphicscreen(1)
0240   RANDOMIZE
0250   fullscreen
0260 ENDPROC housekeeping
0270 //
0280 PROC draw'it // puts turtle through his paces
0290   pencolor(black)
0300   penup
0310   moveto(319,0)
0320   LOOP
0330     joystick(2,whr,button)
0340     setheading((whr-1)*45)
0350     forward(skill'level)
0360     selection:=getcolor(xcor+1,ycor-1)
0370     CASE selection OF
0380     WHEN black
0390       blackout
0400     WHEN blue
0410       NULL
0420     OTHERWISE
0430       otherout
0440     ENDCASE
0450   ENDLOOP
0460 ENDPROC draw'it
0470 //
0480 PROC block // trashes up the neighborhood
0490   // prints block at specified location
0500   //
0510   xlocation:=5; ylocation:=190
0520   color:=black
0530   pendown
0540   squares
0550   FOR areas:=1 TO 50 DO
0560     xlocation:=RND(10,319)
0570     ylocation:=RND(10,199)
0580     color:=RND(white,light'grey)
0590     squares
0600   ENDFOR areas
0610 ENDPROC block
0620 //
0630 PROC instructions // educates you
0640   USE graphics
0650   textscreen
0660   PAGE
0670   PRINT
0680   PRINT
0690   PRINT
0700   PRINT "plug joystick in port 2 "
0710   PRINT
0720   PRINT "move joystick to control"
0730   PRINT "motion of Tom-turtle"
0740   PRINT
0750   PRINT "idea is to avoid color blocks"
0760   PRINT
0770   PRINT "blocks are randomly located."
0780   PRINT
0790   PRINT "skill level is 1 to 5,"
0800   PRINT "with 5 most skillful"
0810   PRINT
0820   PRINT "press RUN STOP-RESTORE"
0830   PRINT
0840   PRINT "then function key F7 to run again"
0850   PRINT
0860   PRINT "NOTE:        "
0870   PRINT
0880   PRINT "  TURTLE ENTERS, LOWER RIGHT"
0890   PRINT
0900   PRINT "****************************"
0910   PRINT
0920   pause(2000)
0930   REPEAT
0940     INPUT "input skill level: ": skill'level
0950   UNTIL skill'level>=1 AND skill'level<=5
0960   fullscreen
0970 ENDPROC instructions
0980 //
0990 PROC blackout
1000   FOR cycle:=1 TO 50 DO
1010     background(black)
1020     pause(50)
1030     background(purple)
1040   ENDFOR cycle
1050   clearscreen
1060   pendown
1070   pencolor(yellow)
1080   textstyle(4,4,0,1)
1090   plottext(10,150,"WINNER !")
1100   plottext(10,110,"WELCOME")
1110   plottext(10,70,"HOME,")
1120   plottext(10,30,"TOM-TURTLE!")
1130   WHILE TRUE DO NULL
1140 ENDPROC blackout
1150 //
1160 PROC otherout
1170   pendown
1180   clearscreen
1190   pencolor(red)
1200   textstyle(4,4,0,1)
1210   plottext(10,150,"S O R R Y !")
1220   WHILE TRUE DO NULL
1230 ENDPROC otherout
1240 //
1250 PROC hues
1260   //
1270   // this is utility for converting color numbers
to color names
1280   //
1290   black:=0
1300   white:=1
1310   red:=2
1320   cyan:=3
1330   purple:=4
1340   green:=5
1350   blue:=6
1360   yellow:=7
1370   orange:=8
1380   brown:=9
1390   light'red:=10
1400   charcoal'grey:=11
1410   grey:=12
1420   light'green:=13
1430   light'blue:=14
1440   light'grey:=15
1450 ENDPROC hues
1460 //
1470 PROC squares
1480   moveto(xlocation,ylocation)
1490   showturtle
1500   pencolor(color)
1510   draw(10,0)
1520   draw(0,-10)
1530   draw(-10,0)
1540   draw(0,10)
1550   fill(xlocation+5,ylocation-2)
1560 ENDPROC squares
1570 //
1580 PROC lead'in
1590   // provides a theme for the game, giving the
player some background
1600   //
1610   PAGE
1620   PRINT
1630   PRINT
1640   PRINT
1650   PRINT "TOM-TURTLE IS LOST!"
1660   PRINT
1670   PRINT "TO REACH HOME - THE BLACK SQUARE IN THE
UPPER LEFT CORNER "
1680   PRINT
1690   PRINT "HE NEEDS YOUR HELP!"
1700   PRINT
1710   PRINT "PLEASE, GUIDE HIM THROUGH THE DANGEROUS
TURTLE BLOCKS"
1720   PRINT
1730   PRINT "IF HE TOUCHES ONE OF THEM, HE IS A
GONER!"
1740   PRINT
1750   PRINT "ONLY YOU CAN SAVE HIM!"
1760   PRINT
1770   PRINT "TOM-TURTLE WANTS TO GO HOME!"
1780   PRINT
1790   pause(5000)
1800 ENDPROC lead'in
1810 //
1820 PROC pause(wait)
1830   FOR delay:=1 TO wait DO NULL
1840 ENDPROC pause
```

**Write a CP/M Word**
**continued from page 288**

utility, Filter.Com. Filter is a program that adds or removes carriage returns and high bits from text files to make the transfer of texts from word processing programs like WordStar to and from WRITE possible.

WRITE like Caesar's Gaul is divided into three parts or blocks. In addition to the edit block, there are disk and print blocks. The disk block is very powerful providing more features than the comparable mode in WordStar. It automatically displays the amount of memory occupied by the current file, as well as the total RAM memory available for the current file and number of words in the file. (This last feature is especially valuable to professional writers.) The disk block also automatically keeps track of the number of files in the currently logged disk and the amount of disk memory still free. The disk block provides excellent file handling features. Commands in the disk block only require one letter. The D (directory) command not only provides a list of files in the currently logged drive, but also includes the amount of memory each occupies. The K (Kill) command is a very good command of this type since it is similar to the original sweep. The disk mode also can access memory devices A through P and user areas 1 through 15 on each device. Files can be loaded into the current file at the beginning, the end, or at the cursor. Files can also be saved in totality, or from the beginning to the cursor, or from the cursor to the end. Saving from a marked block in the current file is also possible. The display width can also be altered in the disk mode.

Anyone who has ever attempted to save a WordStar file on a full disk knows the meaning of frustration. With WRITE, disks are relogged every time a disk command is entered, so a new disk can be inserted into either drive at any time. Since both Word processing program and text are entirely resident in RAM, both A and B drives are available for saving text files. The currently logged can be changed at any time from the disk block. Disk file as well as the file in RAM can be renamed at any time from the disk block. The print block is accessed from the disk mode by P (print). Access to the edit block is accomplished by the escape key. The escape key also is used to access the disk block from both the edit and the print blocks.

The print mode provides automatic print formatting. Files are printed from RAM rather than from disk. But the file in memory can be linked to files stored on disk, and these files will be loaded and printed sequentially. The current print format is displayed in a Menu at the top of the print block display. Altering the current format is quite simple within the print block. In addition, more complex format commands can be embedded in the text using dot commands. Personally, I have put dot commands second only to cancer on my list of things to avoid. For most purposes, I find that it is possible to avoid using dot commands. Although WRITE was not designed as a what you see is what you get word processor, it is relatively easy to set the screen width to the same width you intend to print. Then simply use cursor commands or the Tab key to format. Then be sure that the print width is the same as screen width. Vola, WRITE has become a what you see is what you get word processor. If you like dot commands, and you want to preview your creation before you commit it to paper, WRITE provides a print to screen feature. Linked files can be printed to screen sequentially if you choose to see them together. The print to screen command can also be used for previewing of a specified block of the memory resident file.

WRITE is limited to the 65K RAM limit of 8 bit CP/M computers. Within this limitation it is very fast and powerful. Among CP/M word processors that I am acquainted with, WRITE is unparalleled in the ingenuity of its structure and coding. It is not a business program. It lacks mail merge capacity. It is also limited in its usefulness to scientists and academics since it presently lacks footnote formatting, and indexing and table of contents handling facilities. These problems can be overcome, but it may be better to purchase the word processing program you need than to try to make due with a program that was designed for someone else's needs. The strength of WRITE lies in its text creation and editing capacity. Few word processing programs are better designed for the creative writer than WRITE.

Loading WRITE and a 26K text file from disk required 17 seconds. Loading the same text from within WRITE required 11 seconds. Saving the 26K text to disk required 25 seconds. Scrolling through the text required 57 seconds.

Workman and Associates include the two utility programs on the disk with WRITE. In addition to the Filter utility, Workman and Associates also provide are XD a directory program. A simple installation program allows WRITE to be configured for virtually every CP/M computer and most printers.

Workman and Associates can be contacted at 112 Marion Avenue, Pasadena, CA 91106. For the present price of WRITE call (818) 791-7979. ●

**Desktop Publishing**
**continued from page 132**

and art directors usually are ecstatic after moving from manual layouts to desktop publishing for such projects.

Some companies, however, are finding that desktop publishing systems haven't increased productivity as much as anticipated. Why? People spend too much time enjoying their new freedom "to get things just right."

"Even our interoffice memos are works of art these days," one executive told me recently. Two high-priced corporate officers said they themselves often spend more time than they should "prettying up" their letters and memos (formerly typed from brief notes or verbal instructions by their secretaries) with different type fonts and sizes.

Now let's assume you move from a 16-page brochure to a 100-page report or a 350-page proposal. Laying out all those pages individually on your monitor with a page layout program still beats the old manual method—but teaming an old technique with a new technology isn't always effective. Some of the first auto makers learned that when they tried to steer their creations with reins and tillers!

The creators of WYSIWYG page composition programs themselves point out that their software isn't meant to be used for long documents. Paul Brainerd of Aldus expressed his amazement in a CORPCON 86 seminar that, "PageMaker has even been used to produce books, something we didn't plan or expect."

**Two Approaches Have Their Place**

So while page composition software shines in some areas—and has received all the attention to date—it isn't necessarily the most efficient way to use a computer for all desktop publishing tasks.

What's the alternative?

Perhaps it's second generation software that provides a sort of "style-guide" publishing. This type of software may not be as exciting as WYSIWYG programs and often is harder to learn initially, but it makes more sense for long documents.

These second generation programs allow you to define all specifications for a document in a single format specification file—which I call a "style guide."

You can change the style without altering the document file. You can use a prepared style guide that comes as part of the software package, modify it, or create your own guide.

No programming is required, although experienced users generally can use macros and conditional format commands for special purposes.

Commands included in a document file trigger instructions specified in the style guide. Headline type fonts and sizes are detailed in the style guide file, for example; commands in the document file see that the heads are printed in the right face, size and position.

A major benefit is that text changes can be made anywhere in the document file, even on Page 1, without requiring you to go back in and repaginate all the following pages.

Style-guide programs might also be called "batch process" programs, except the term raises the hackles of many veteran computer users. They associate it with early mainframe days when computing was centralized and only the highest of computerdom's high priesthood had access to the magic machines.

Jobs were done in batches, all at once, and individual users had no control over or interaction with programs as they were run. Any reminder of those "bad old days" is not popular and "batch" remains a dirty word in many computer circles.

Fancy Font was a forerunner of style-guide publishing programs. It could, and still does, produce near-typeset print quality—especially the LaserJet version. It uses "style-guide" command files combined with commands typed directly into document files. I've used it in crude forms of desktop publishing for three years, but it's slow, can't incorporate graphics and has other limitations.

A later, more powerful example of a style-guide program is Power Text Formatter.

Two other text-only programs are Laser-Press, which Award Software bills as an "office publication program," and MicroTeX, a full microcomputer implementation of TeX, the technical text processing program. The latter is especially valuable for technical documents that include mathematics and formulas; it supports dot matrix and laser prints as well as phototypesetters.

Emerging Technology Consultants has been testing a new version of the Wordix test formatter that is part of the firm's Professional Writing Package. The new program will be able to handle different fonts and types sizes within a single document file, providing another text-only publishing option.

The most sophisticated of all the second generation style-guide programs I'm aware of to date, however, is LaserScript. We plan to bring you a detailed review of this powerful software package next month. Meanwhile, here are some of the things it does:

Integrates text and graphics from such programs as AutoCAD, PC Paint+ and In.A.Vision/Windows Draw.

Works with either a Hewlett-Packard LaserJet Plus or IBM 3812 Pageprinter; provides full support for manufacturers' type fonts, plus those from SoftCraft and VS Software for the LaserJet Plus.

Provides document construction to your specifications, including style definition, headers and footers, numbered section headings, lists, footnotes, table of contents, cross references, page imposition.

Automates line fitting, pagination, footnote and figure numbering, page and section numbering.

Composes lines to fit column width or exactly as entered; text can be aligned flush left or right, centered or justified.

Sets type underscored, uppercase, subscripted or superscripted in bold, italic or roman styles of any available fonts.

Indents text on the left or right; identation can be delayed for a specific amount of vertical space or automatically restored after a specific amount of vertical space.

Uses a generic document markup system with such plain-English, easy-to-remember commands as "chapter," "section," and "paragraph." You simply enter the name of the text element to follow, type the copy—and LaserScript does the rest.

However the market turns around, and whichever type of program prevails in desktop publishing, all of us who are interested in it can rejoice. Things will only get better as a result of increased competition and the innovations that

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**Desktop Publishing continued from page 292**

competition will spur.

### Power Text Formatter Offers Low-Cost Desktop Publishing

It wasn't too many years ago that $90 wouldn't buy you even an entry-level word processing program. Now that amount buys you entry into the world of desktop publishing—via PowerText Formatter.

Beaman Porter, Inc. makes an interesting comparison to describe how its PowerText Formatter works. It also explains that, with a laser printer, the program provides text-only desktop publishing capabilities—but soon will be able to integrate graphics with text.

"Most word processors emulate typewriters... PowerText Formatter emulates dictation."

The analogy is a good one. Word processors require users to set margins, tabs and transform text on the screen. After rewriting and editing, considerable attention often must be given to repagination and reformatting. The same is true for most WYSIWYG page composition software.

With PowerText, you specify a certain style to be followed at the beginning of a document. Instead of saying "Please take a letter, Miss (or Mr.) Jones," you type the command, /letter, to start.

Then you write your letter, including simple commands—/to, /title, /sal for salutation—much as you would instructions in dictation. Otherwise, you type the text without worrying about such details as appearance and margins, relying on PowerText to act like a good secretary and transform the result into a professional looking document.

The program can be used with any word processor or text editor that produces ASCII files. It also supports IBM Writing Assistant, PFS:Write, WordStar, VolksWriter, MultiMate, DisplayWrite 2 & 3 and XyWrite.

I used the Edix text editor from Emerging Technology's Professional Writers Package, the PC-Write editor and MultiMate with PowerText for this review. All worked well, although I found the two text editors were easier to use than MultiMate.

To format and print documents you invoke PowerText by typing "PT;" a main menu then appears. It offers a variety of options, as the accompanying sample shows, and tells you what text editor or word processor and printer the program is set for currently.

Next, you simply choose options from a series of menus and respond to prompts that follow. If it seems confusing at first, keep reading the manual carefully and work with the samples included. I found that made things surprisingly clear and easy in a short time.

### Format Files Govern Document Style

"Underlying PowerText is the notion of style," say its creators. "Memos have a certain style; so do letters, conference reports, manuscripts, articles, specifications, contracts, etc.

"Headings, footings, margins, pitch, type style, paragraph indentation, columnar layout, footnote placement, cover page information...vary for each type of document."

PowerText stores style definition information in what I've called by the generic term, "style guides," in this special Desktop Publishing section. Beaman Porter calls their version "Format Files."

Whatever the name, these are ordinary text files that store two kinds of information:

**Global**—which determines such things as margins, vertical spacing, page length;

**Keywords**—which identify and define all header, footer, cover and closing page items for any given style.

These format files and commands embedded in text files combine to control the final printed appearance of a finished document.

The program provides a variety of format files for everything from letters, memos and weekly schedules to newsletters, theses, business reports and scripts.

### You Can Concentrate On Writing

The result is that you can write and rewrite without concerning yourself about the mechanics of typing or style. Just be sure you insert the simple slash commands in your text, as shown in the accompanying examples.

If none of the pre-defined format files included meet your needs, modifying them to suit your purposes isn't difficult. All the information you'll need to do so—or to create your own format files from scratch—is covered more than adequately in the 270-page, trade paperback-sized PowerText manual.

The manual itself, by the way, was written on an IBM PC Convertible using PC-Write and PowerText Formatter; camera-ready masters were printed with a Hewlett-Packard LaserJet Plus using HP soft fonts.

While the program achieves maximum effectiveness when used with an HP LaserJet Plus, it also provides automatic support for other laser printers.

Drivers also are supplied for a wide variety of dot matrix and daisy wheel printers.

This is important to those of us who can't afford to spend $2000 to $6000 for a new laser printer—and it's a benefit not available in page composition WYSIWYG publishing programs like PageMaker and others.

If drivers for your printer aren't included, the manual explains how to prepare your own, with an assist from the printer manual. The process is part of an Install program you get to via menus; you just respond to a series of questions about your printer's capabilities.

To add graphics capability, links are being added so Inset can be used with it. Inset will allow charts and other graphics generated by various programs to be imported and positioned in PowerText files.

Beaman Porter reports that it plans to offer the two programs as "an attractively priced package." If the price is under $200 as Beaman Porter has hinted, the package surely would be attractive!

To sum up, PowerText offers an alternate for those who want to try desktop publishing, but can't afford more costly systems. Team it with the equally inexpensive PC-Write and you've got a budget-priced package that's versatile, powerful and easy to use. Personally, I was very impressed, and I plan to use the program a lot in the future.

When Beaman Porter adds the graphics-insertion link to Inset, the package promises to be even more attractive and it should answer the desktop publishing needs of many users.

Contact: PowerText Formatter, Beaman Porter, Inc. 417 Halstead Ave., Harrison, NY 10528; (914) 835-3256. ●

**Sinclair Column continued from page 131**

market conditions.

As you would expect, support for the ZX-81 line (T/S 1000, 1500) is a bit scarce, although there are many people still using this computer. This, perhaps, was the biggest surprise for all of us in attendance at the Cincinnati get together. This small wonder (often called a toy by those who don't know any better) was the first computer many of us either owned or worked on.

A symposium of ZX-81 users was held at the computerfest, and turned out to have been one of the most popular during the two day event. Among the uses discussed, the most visually exciting was a robot vehicle controlled by a ZX-81. These ZX-81 owners were still very enthusiastic about their micro, and the standing room only crowd was anxious to hear of new developments.

Perhaps the best source of new product information for these computers would be the E. Arthur Brown Company (3404 Pawnee Drive, Alexandria, MN 56308/ (612) 762-8847). Long a supporter of the Sinclair (and Timex/Sinclair) computers, company owner, Eban Brown, still actively seeks out the rare new release for the ZX-81. Earlier in the year we reviewed an extended BASIC for the ZX-81 being offered by E. Arthur Brown. In fact, they still have many of the programs originally offered by both Timex and other software houses. These are available on an "as available" basis, so a telephone call may produce that classic software you are searching for.

Two new programs appeared for the T/S 1000/1500 computers from relative newcomer Weymil Corporation (Box 5904, Bellingham, WA 98227). Thrust is a software package comprised of two parts—SincArtist HR and SincArtist 1.3—producing a cursor controlled high resolution graphics package for these computers. One program works on the unmodified T/S and T/S 2040 printer, while the second requires about $10 in parts and a few minutes with a soldering iron.

A second program is an Xmodem telecommunications program for the same ZX-81 & T/S 1000/1500 computers. There are versions available for either the Westridge or Byte-Back modems which allow for Xmodem transfer of data (see explanation below of this protocol). Both 16K and 64K versions are available and it can be saved onto a Hunter Board.

Annoyed by the extremely slow cassette interface on the old T/S 1000? The answer comes from Larken Electronics (RR #2/Navan, Ontario, Canada K4B 1H9/ (613) 835-2680, in the guise of the Larken Disk Drive interface. The interface comes with the necessary hardware to connect the drives and Larken DOS to handle the operation.

There was even some development in support of the T/S 1500 computer in 1986. Fred Nachbaur, well known in the Sinclair community almost from the beginning, has written a high resolution dungeon game for this mostly ignored computer. Dungeon of Ymir is 24K of machine code programming containing nine levels, sixteen types of monsters, fourteen objects and six spells. A fast save with auto boot facility enables you to save in progress games and to load the entire program in seventy seconds. Various versions are available depending on the hardware setup you have. For more information write to Fred Nachbaur (C-12 Mtn. Stn. Group Box, Nelson, BC, Canada VlL 5P1).

The developments for the T/S 2068 continued along producing a number of new products during 1986. One of them takes advantage of one of the built-in but neglected features of the T/S 2068.

After the T/S 1000, the 48K user RAM in the T/S 2068 seemed quite enough, but Timex designed their new computer with bank switching ability able to utilize a number of 64K banks, switching them in or out as needed. (The Z80 CPU can only address a total of 64K at any given time, so additional memory must be able to be handled in banks such as these. (If you wanted extra memory on your T/S 1000 all you had to do was add the appropriate piece of hardware directly to the back edge connector, make two appropriate POKEs and voila! Up to 64K could be added in this manner. There was a system which allowed you to add up to a Mbyte to the T/S 1000, but the price was so high that it was not practical.

The T/S 2068 could not handle that simple of a memory expansion. In fact, there is some bank switching which goes on in the normal operation of the computer since the 24K ROM is in addition to the 48K RAM—a total of 72K—cannot be addressed in its entirety. But now a non volatile memory expansion has been developed for the T/S 2068. This cartridge goes into the command cartridge port of the T/S 2068 and can be used for instant on programs and/or data to which you want immediate access. This memory expansion unit is available from E. Arthur Brown Company.

Another product released for the T/S 2068 this year which caused considerable interest is a piece of software called LOADER V. This is a companion program for the telecommunications standard program, Mterm. Actually it is a set of five programs for use with your modem.

The first part of this program adds additional directory space to Mterm in which you can store twenty additional numbers. When added to the

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**Sinclair Column continued from page 293**

fourteen spaces provided by Mterm, you now have a total of thirty-four allowable entries. Add to that increased dialing speed and automatic redial, and you now have some very powerful new features available from your terminal software without losing any of Mterm functions.

Another program in this package adds the much desired XMODEM transfer protocol to your system. Anyone who has spent any time on-line will be aware of the fact that XMODEM is the most common type of error detection protocol available. XMODEM works by sending blocks of data from computer to computer while verifying that the block was sent correctly. By totaling the value of the bytes being sent (the checksum) and having the receiving computer verify this amount, if an error occurs the block is re-sent.

The remaining three utilities can be used to load programs while still on-line, translate files to Tasword II format, or upload files in HEX format.

This program is available from author Kurt Casby (25 Battle Creek Court, St. Paul, MN 55119).

Another newcomer to the field, Novelsoft (106 Seventh Street, Toronto, Ontario, Canada M8V 3B4, 416-259-8682), has come out with a few impressive pieces of software for the T/S 2068 this year. Artworx is a graphics program for either the Spectrum or T/S 2068—both versions are included. A slide show/animator utility is included and Microdrives and Kempston Joysticks are supported.

Timemachine is Novelsoft's BASIC compiler for the Spectrum and T/S 2068. This compiler has features previously unheard of on Sinclair BASIC compilers. The standards in this field do not support floating point operations or string handling—Timemachine does, and at an increase of speed up to 200 times faster than interpreted BASIC! In fact, this compiler handles all Sinclair BASIC except for I/O. Look for a full review of this program early in 1987.

Novelsoft's newest program is called—modestly—The Worx. This is a suite of personal organization programs including a schedule/planner, notepad, telephone book, calculator, real time clock, perpetual calendar and more. As with the other programs, The Worx comes with both Spectrum and T/S 2068 versions, and is microdrive compatible.

New Spectrum software is still appearing in England, and for those of us who own some form of Spectrum emulation, they are available to us as well. Although a few U.S. Sinclair dealers do carry imported Spectrum software, it still has been my experience that the best way is to order directly from Great Britain. Still the best (and fastest) firm I have found is Speedysoft (The Blacksmiths, Radnage Common, Buckinghamshire HP14 4DH, England) who used to call themselves Software Supermarket. They accept Visa/Mastercard so you don't have to worry about exchanging currency, and they dispatch your software so fast that you usually have your program within a week.

Of course not everyone has a Spectrum emulator, so for you I suggest contacting Knighted Computer (707 Highland Street, Fulton, NY 13069, (315) 593-8219), who continues to translate classic Spectrum software to run on the unaltered T/S 2068.

The QL is still adding products to the available lists almost every day as the QL continues to establish itself in the Sinclair community if not in the computing community as a whole. Now available in kit form, minus the manual and bundled software, the price of the fully assembled QL including the full manual and software has come down to the point where a number of dealers are advertising it for $209. Quite a bargain indeed! In addition, a number of dealers are still offering various additional software (usually produced in-house) to new purchasers. Examples of these are Markel Enterprises (P.O. Box 2392, Secaucus, NJ 07094-0992, (718) 627-1293), who is offering an Address Book program, and Quantum Computing (Box 1280, Dover, NJ 07801, (201) 328-8846), supplies a graphics demo cartridge—with some utilities such as a banner maker to QL purchasers. If you already own a QL, however, you can still obtain copies. Write to these companies and mention that you read about it in *Computer Shopper* and they will tell you how to get your free copies.

Games, as usual, keep cropping up as fast as you can spot them. The most unusual one released this year comes to us by way of Pyramide Software of France. Taking advantage of the high resolution facilities of the QL in conjunction with an RGB monitor and a pair of red/blue eyeglasses, Wanderer brings the action off of the screen and at you in amazing 3-D action. Pyramide Software is distributed in the U.S. by Curry Computer (P.O. Box 5607, Glendale, AZ 85312, (602) 978-2902) and is carried by most American QL dealers. To see what games are available write to these dealers and ask for a copy of their latest catalogues. (Don't forget to mention where you got that suggestion—here in *Computer Shopper*.)

Speaking of RGB monitors, the Sinclair Vision QL matching RGB monitor which was being sold at $299.95 is almost non existent any more. I am informed that there still are a few left at that price, although a few dealers have raised the price on the few remaining units. If you are looking for an RGB monitor built to match your QL both in performance and design, check the QL dealers for availability. Once they are gone, look for more expensive monitors being sold by these dealers.

The first of the American software for the QL began to appear during the year just finished. First to the ribbon was the most recent version of War in the East by Mark Steuber of Sharp's (Route 10, Box 459, Mechanicsville, VA 23111; (804) 746-1664). War in the East is the QL version of a war strategy program which has been popular since the original ZX-81 version was released early in this decade. Following close on its heels was Concept 3-D by Robert Fingerle (Textwriter series). Concept 3-D is a slick 3-D CADCAM program which really shows off the QL's graphic capabilities. Both of these programs are available from most QL dealers.

For those of you who remember the BASIC compilers which have been available for the earlier computers, as well as my caveats regarding their limitations, consider Supercharge from Digital Precision of England. This is a SuperBASIC compiler which is capable of compiling almost 100% of all programs written in SuperBASIC without much in the way of alteration being required. In fact, programs written and compiled using this program may be marketed without any requirements for the purchaser to own the compiler. (A license fee to Digital Precision is required though.) Concept 3-D is one such program.

Hardware for the QL has come into its own as well during 1986. Almost everything you would want to add to your QL is available. Expanding your computer to a full 640K is both simple and inexpensive. Any QL dealer can sell a 512K expansion pack which will connect directly to the expansion bus on the left of your QL for around $200. Many of these have a throughport to which you can add a disk controller board. (The extra memory is not necessary for use with the controller board, but it sure does open many new options.) These disk controllers can handle any size drive (8", 5½", 3½", or 3") but no hard disk—yet. (I'm told that a hard disk controller should be available early in 1987 if not yet available when this issue hits the stands.)

The first American hardware product has been released in 1986—the QL Talker. Speech synthesizers have always been an item which have attracted a lot of attention, although their full potential has never been realized on the Sinclair computers (as well as the others). One of the problems with earlier models was the necessity of having to load software separately. With the new QL Talker this is not necessary. All you have to do to use it is plug it into the serial port, connect it to a power outlet and open a channel to the Talker. Then, by printing to that channel (ie: PRINT #7, "Hello") you get speech! This can be used in conjunction with almost every application available. In fact, I just had my QL Talker read this column to me. I printed a copy to disk and then COPYed it to the serial port. It sounds a bit strange, but does the job. Check with your QL dealer for availability or write to Curry Computer who is distributing the Talker.

This is not the entire list of new products during 1986, and I look forward to hearing from you, the rank and file of the Sinclair community, to keep me informed of others. Don't forget our weekly get togethers on CompuServe—Wednesday nights, 10:00 PM—GO CLUB. In the meantime, once again I thank *Computer Shopper* for recognizing that we are still here and continue to support our computers.

What's in store for next year? That's yet to be seen, but I predict that there will be something that will please, disturb, delight, amuse and annoy you—the faithful Sinclair owner, so stay with us here in *Computer Shopper* for all the goings on! ●

**Ampro's SCSI continued from page 131**

all the different types of interfaces, felt that any sort of standard should have a generic name, rather than one that glorified the originator of the standard. It was, in some respects, a petty and jealous attitude. After all, who would deny that it was Darwin's Theory of Evolution, or Einstein's Theory of Relativity. Despite the fact that Shugart made the standard available to everyone, they wound up taking a few on the chin. Quite possibly, they were ahead of their time in trying to influence a standard on the industry. The industry simply wasn't ready for it.

While the debate roared, Shugart was already working on a more advanced hard disk interface with NRC's IC division that would expand the limitations of the protocol. I think they saw that the market was evolving to a point where business would require a larger base for mass storage than SASI could provide. This thinking was stimulated by the fact that desktop computers would soon rival the minicomputers in terms of available memory, speed and storage, but at a much lower cost ratio.

SASI was pretty much a single-ended option. That is, you hooked up a controller board and one or two hard disk drives. The new standard was a superset of the SASI command structure that would have an open-ended option for linking up to 8 devices through a 50-pin ribbon cable bus. It was called SCSI (Small Computer Systems Interface), and the chip that established the protocol for communication was the NCR 5380 SCSI controller.

But there was more to it than just a mere enhancement of the protocol. The original SASI input and output lines were retained, as were the basic control lines of the bus. Shugart and NCR saw no reason why they should obsolete a major portion of the hard disk industry by redefining these signal lines. Instead, they felt it more appropriate to continue what was being referred to as the ST506 interface that was adopted from Seagate's implementation of SASI (because they sold more units of a 5-MB hard disk model called the ST506 than anyone else). So, if new models of hard

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**Ampro's SCSI continued from page 294**

disk drive technology would continue to support the original definition of these signal lines and also provide additional control lines (to be called the ST412 standard under SCSI), then the business community, as well as the consumer, could upgrade their mass storage devices as needed.

The SCSI concept has been evolving slowly in and out of committee meetings under the sponsorship of ANSC. The committees are made up of representatives of various hard disk drive and controller manufacturers who have been holding secret conclaves at various ports of call, as they tried to reach some sort of compromise on the interrupt structure of the SCSI bus.

Early in 1986, the working committee, under the direction of Daniel Loski, Marketing Director of the OMTI Division of Scientific Micro Systems, finally agreed on everything they felt a need to agree upon, and an addendum to the ANSC X3T9.2 document was finally distributed for everyone's benefit.

While this activity was in progress, a small manufacturer of single board computer systems named Ampro Computers, has taken the SCSI standard and moved it into the future, by the implementation of a bus arbitration scheme that would ultimately allow up to 64 resident devices on the bus, many with individual logical unit numbers. They called it SCSI/PLUS.

One of the things I had planned to do during my recent visit to Ampro, was to sit down and talk to the architect of SCSI/PLUS, Richard B. Lehrbaum, VP of Engineering. Although Lehrbaum had written a proposal on SCSI/PLUS for the ANSC Committee, and has authored some articles for the industry's technical publications, I wanted to personally learn how and why he decided to take on the industry as a whole.

**PR:** What led to SCSI/PLUS? Was it something you have been working on for years—or something that evolved out of a need?

**RL:** I had been following the progress of the emerging SCSI standard, but really hadn't given it much thought until after we released our first product. That was the original CP/M Little Board. It was a kind of industry first—a complete computer system designed to mount on a disk drive.

We made an immediate impact on two markets: the so-called "hackers" who wanted to upgrade their old S-100 systems, and the industrial market. As we pursued the computerized applications market, we began to realize that they needed more than just two serial ports, floppy and printer control. There was a limit to the kinds of applications that could be served by these ports. They tend to be keyboard intensive, and without any other ports on it, what can you control? Nothing, unless you start adding other boards onto it—something we did not want to do.

This taught us that what we really needed was a way to open the architecture to add additional ports, without adding extra hardware. At the same time, the 8-bit processor in our Little Board was ideally suited to controlling machines, A/D and D/A converters, and all kinds of laboratory equipment. Hard disks were becoming cheaper and a lot of people were asking us to provide some kind of interface.

Thus, I was presented with a two-fold problem. How do we satisfy the needs of the industrial market to provide an open architecture that would allow them to interface to many different types of equipment? And how do we satisfy the needs of the desktop business user, who required a hard disk to store his data. I really didn't want to trade off one for the other.

And then, one day, it hit me. Why not use SASI (or SCSI as it was then being referred to) as a small computer systems interface. Everyone was in the mindset that SASI/SCSI was only a hard disk interface. Most of the world still thinks of it that way. But what convinced me otherwise was that SCSI was really a Parallel I/O bus—with bi-directional bits and control lines—so it should be possible to make that into an I/O bus for many different applications; and—oh, by the way—use it as a hard disk interface for typical SASI/SCSI applications.

At its inception, SCSI/PLUS was two things. On the one hand, it was a philosophy—the architecture; on the other, it was a means for using it for more than just mass storage. That's what the PLUS meant from that perspective.

There was also the flip side of SCSI/PLUS, which was the idea of expanding the address space of SCSI, because if you planned to add I/O devices to the bus, in addition to hard disk and tape storage devices, you can easily run out of address lines, because SCSI was limited to 8 I/O addresses. This is a pretty small bus. The Z80 has 256 I/O addresses, and people think of that as being limited.

SCSI, being an intelligent bus, could have a card on it that could talk to many different devices. So, in fact, 8 isn't as bad as it sounds, because you could have logical units plugged into each of those 8 devices. But I felt it was important to be able to extend that limitation—to be able to talk to more than 8 devices, especially when the bus structure allows you to go 18 feet, because it's buffered I/O.

So, I looked at the specs and figured out that it shouldn't really be a problem, and I came up with a scheme to allow 256 addresses on the bus. But in looking at the electrical properties, finally limited that to 64.

**PR:** Have you actually hooked up 64 devices to the SCSI/PLUS bus?

**RL:** Not yet. And once the real implementation is looked at for lots of devices, we may want to limit that to a smaller number. The important thing to remember is what I mentioned earlier. SCSI/PLUS is both an architecture and a philosophy that allows you to think and plan systems in terms of more than 8 devices. I wrote it up as a spec—a proposed extension to the ANSC standard, which would allow a couple of additional bus phases in it to handle the extra devices.

**PR:** OK. You've created an architecture to expand the ANSC SCSI bus. What is Ampro doing to actually implement the SCSI/PLUS standard beyond 8 devices. It's nice to publicize that you can tack on dozens of devices, but how is it done?

**RL:** We recently developed the SCSI/IOP card as a means to access external devices other than disks and tapes. It's a target under our control. It has it's own microprocessor, so all that you require is a simple software driver so that the host can talk to a specific I/O device through the SCSI/PLUS I/O bus.

**PR:** Since most of the current users of SCSI are the hard disk controller manufacturers, how are they reacting to SCSI/PLUS?

**RL:** I think the disk and tape guys will not implement SCSI/PLUS unless it's for their own in-house testing. They don't really see, with their limited vision—of disk and tape being the whole story—as to why anyone would want to be able to interface more than 8 devices.

On the other hand, AT&T's ANSC committee member has expressed some interest in our capabilities, because they envision larger systems than the average computer manufacturer, with a large number of peripherals on SCSI. So, different types of needs have to be placed into the proper perspective in order for anyone to understand how SCSI, as a mass storage interface, and SCSI/PLUS, as a means to add more than just mass storage, relate to real world applications.

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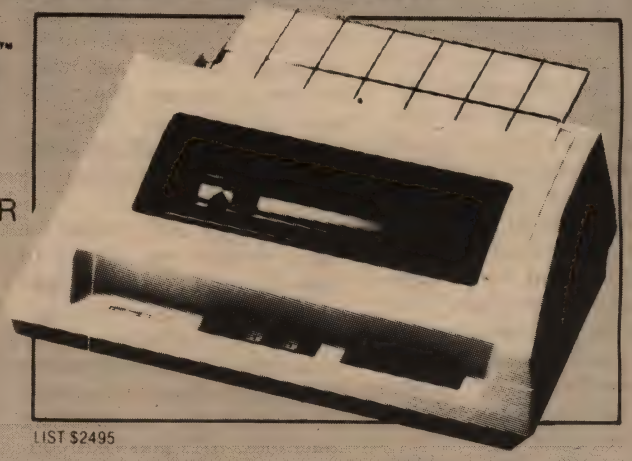

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This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

### SPECIFICATIONS

**Carriage Width** 132 Columns (at 10 pitch)

**Print Method:** Impact dot matrix, bidirectional, logic seeking in both text and graphics

**Print Speed:** 420 CPS/Draft, 104 CPS/Correspondence Quality, 2500 dots/sec – standard graphics; 1250 dots/sec – high-density graphics

**Print Head:** 8-pin, staggered arrangement

**Character Sets:** Standard 96 ASCII printing in 17 fonts

**Line Spacing:** n/180 (n=0-255)

**Paper Feed:** Pin feed (paper width adjustable) and built-in friction feed

**Paper Width:** 5" to 15" (pin feed), Up to 16" (feed)

**Paper Path:** Rear and bottom entry

**Paper Thickness:** Original plus 4 copies (5-part)

**Ribbon:** Cassette style, single color (black)

**Interfaces:** Parallel – Centronics-style, and Serial –RS232C Asynchronous

**Baud Rate:** 1200, 2400, 4800, 9600, switch selectable

**Protocols:** X-ON/X-OFF, READY/BUSY, ETX/ACK, switch selectable

**Buffer:** 18K

**Reliability:** MTBF – 800 hours continuous printing; MCBF – 200 million characters; MTTR – 30 minutes.

**Power:** 117 VAC ± 10%, or, 220 VAC ± 10%, 50/60 $H_z$

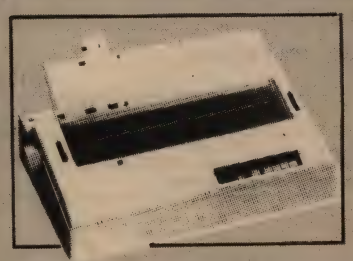
**Power Consumption:** 55W (Standby); 175W (Operating at self test print); 250W (Operating at heaviest duty)

**Environmental Limits:** Temperature (operating) 5 -40 C; 40 -105 F; Humidity (operating) 20-80%

**Dimensions:** 595mm (W) x 194mm (H) x 405mm (D); 23.4" (W) x 7.6" (H) x 15.9" (D).

**Weight:** 27kg; 60 lbs

**Extra Long CR 420 Ribbon Cartridges $16.95 6+ $14.50**



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## CR-4

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- **Superior Performance**
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- **7K Print Buffer**
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This bidirectional, logic seeking marvel lets you adjust the hammer intensity to print anything from single-page letters to five-part forms with equal clarity. A variety of impressive typestyles give you added print versatility.

It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

### Quiet quality.

What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

### Specifications

| | |
|---|---|
| Print Speed | 36 CPS (Shannon text) |
| Print Wheel | 96 petals/wheel, cassette type, ASCII stand. |
| Print Wheel Life | 10 million char./wheel |
| Characters/Line | 132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15") |
| Paper Width | 16.5 in max (419 mm) |
| Copy Capacity | Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.) |
| Carriage Motion | Bidirectional, logic seeking |
| Carriage Rtrn Speed | 750 ms (at 13.2" return) |
| Line Spacing | 6, 4, 3 lines/inch, 1/48" proportional increments |
| Paper Feed | Bidirectional, logic seeking |
| Paper Feed Speed | 4"/second |
| Available Ribbons | |

| | Ribbon Life |
|---|---|
| Single-strike black carbon film | 60,000 |
| Multi-strike black carbon film | 150,000 |
| Single-strike black correctable film | 70,000 |
| Multi-strike black fabric | 500,000 |
| Single-strike red film | 2,000 |
| Correction tape | 1,500 |

| | |
|---|---|
| Interface | Standard RS-232C - Serial |
| Buffer Size | 7K |
| Control Panel | Indicators Select, Power, Alarm, Line, Pitch, and Copy (LEDs)<br>Switches Select, Line Feed, TOF, Line, Pitch, and Copy |
| Noise | Operating – Less than 65 dB |
| Temperature | 50 to 105 F – 10 to 40 C (operating) |
| Humidity | 20% to 80% non-condensing (operating)<br>5% to 90% non-condensing (storage) |
| Power | 120 V, 60 Hz (Optional 120 or 220 - 240 V, 50/60 Hz) 130 W Max |
| Dimensions | 21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm) |
| Weight | 33 lbs (15 kg) |
| Optional Features | Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles) |

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LIST $349 **EPSON LX-86 $CALL$**

The new Epson Spectrum LX-80 is perfect for the vast majority of your personal and professional printing needs, such as reports, term papers, recipe files or mailing lists.

It's easy to set up and operate. And, with Epson's convenient SelecType feature, you can choose from a wide range of typestyles and graphics. With convenient Dual Mode operation, the LX-80 lets you zip through drafts at high speed, or produce finished copies with a high-quality, typewriter-style appearance. And it accepts a complete line of options for easy, future expansion.

Because the LX-80 is made by Epson—the standard of the industry— it's compatible with virtually every computer system made. It inherits a reputation for dependability and durability that's unsurpassed by any other brand. And it offers a full one year warranty—the best in the business.

The new Spectrum LX-80 offers a combination of performance and value at a price that's second to none.

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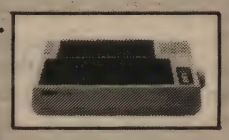
**EPSON FX-85**

LIST $699

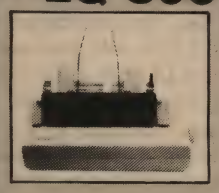


Quite simply the Epson FX-85 is the most intelligent way to print you can find. At a brisk 160 characters per second in draft mode and 32 characters per second typewriter style near letter quality mode, the FX-85 gives you professional versatility. A new 8K internal buffer stores up to 4 pages of data allowing you to print and use your computer at the same time.

Plus, for an added measure of creativity, Epson's exclusive SelecType feature gives you finger tip selection of numerous popular typestyles at the touch of a few buttons. Its easy control panel selector means less time programming when changing typestyles. The FX-85 is equipped with both pin feed and friction feed and connects to your computer by simply plugging in a cable. And with Epson's full year warranty you can be sure you're getting the most in quality, dependability and performance.

Get a hard working business printer designed to give you a powerful advantage in meeting the hectic, high-pressure demands of today's business world. . . get the FX-85!

## LQ 800 & 1000



**– 24 Pin – Letter Quality**

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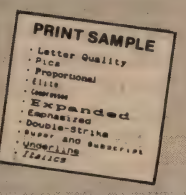


The LQ-800 and LQ-1000 can print at a speedy 180 cps printhead speed in the high speed draft mode. A speed fast enough to put a typical length business letter in your hands in under 25 seconds. Or, for a finished professional look, switch to Letter Quality mode at 60 cps. The results will amaze you. Epson's advanced new 24 pin printhead assures superb resolution page after page. In fact, print quality is so superior to that produced by other dot-matric printers, you'd think it came from a top of the line office typewriter. And for fast, efficient throughput, both print bi-directionally using intelligent, logic-seeking electronic systems. The smart way to put business on paper.

Whether you take one home, use it to help run a small to medium sized business, or use them in a corporate environment, the LQ-800 and LQ-1000 make excellent choices for virtually any printing task. You can turn out drafts at high speed, letter quality copy in seconds, or sharp, finely defined graphics. The 136 column LQ-1000 is ideal for printing spreadsheets and financial reports; while the 80 column LQ-800 can handle everything from correspondence to mailing labels. Both come with a 7K internal buffer that stores up to four pages of data allowing you to print and use your computer at the same time. Easily installed optional Identity Modules let you choose between Extended Epson Graphics, IBM Graphics Printer or Diablo 630 code. The kind of versatility a growing business demands. There are also built-in fonts and optional Font Modules for an array of easy to access font styles. The choice is yours.

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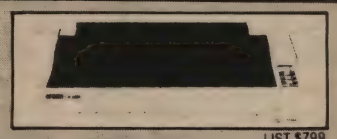

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The new FX-286 Dot-Matrix Printer is ideal for use at home, in the office or multi-use corporate environment. You can turn out drafts at high speed, Near Letter Quality copies in seconds and graphics of superb resolution. Standard Tractor Feed and Friction Feed accommodate virtually any type of paper, single sheet or fanfold. For optimum versatility, SelecType gives you numerous typestyles at the touch of a button. The FX-286 uses the industry standard parallel interface and has a dip switch selectable "dual identity;" Epson standard code compatibility and IBM® printer emulation. You even get build-in IBM graphics character sets for sharp resolution in graphs, charts and illustrations.

**Optimum Versatility:**
- Print drafts at high speed; Near Letter Quality copies; and superb graphics.
- An 8K internal buffer allows you to print and use your computer at the same time.
- Exclusive SelecType feature delivers numerous popular typestyles at the touch of a button.

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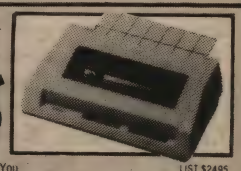

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This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

**SPECIFICATIONS**

**Carriage Width:** 132 Columns (at 10 pitch)
**Print Method:** Impact dot matrix, bidirectional, logic seeking in both text and graphics
**Print Speed:** 420 CPS/Draft; 104 CPS/Correspondence Quality; 2500 dots/sec. – standard graphics; 1280 dots/sec – high-density graphics
**Print Head:** 8 pin staggered arrangement
**Character Sets:** Standard 96 ASCII printing in 17 fonts
**Line Spacing:** n/180 (n = 0-255)
**Paper Feed:** Pin feed (paper width adjustable) and built-in friction feed
**Paper Width:** 3 to 15" (pin feed), Up to 16" (feed)
**Paper Path:** Rear and bottom entry

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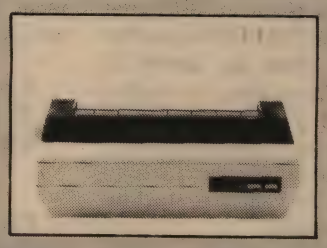

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Capable of an array of printing tasks, the EPSON DX–10 Daisywheel Printer really comes on strong in word processing applications. It can turn out a typical business letter about three times faster than even the most nimble typist. The DX–10 is compatible with most home or office microcomputer systems on the market today, including the IBM PC and the Apple II. There is a wide variety of typestyles available using world famous Diablo interchangeable printwheels for true flexibility and total creativity. You can even get system expansion options such as a tractor feed for long printing jobs and a cut sheet feeder for aligning and inserting individual sheets of paper. And most importantly to back up EPSON'S commitment to excellence, a one year warranty comes with every DX–10 from MidWest Micro. For a dependable look you'll love on your correspondence, get the best you can buy with the EPSON DX–10 Daisywheel Printer.

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**Ampro's SCSI continued from page 295**

**PR:** How do you relate these two concepts?

**RL:** Well, for the personal computer user, having more than one hard disk and possibly a tape for backup storage is over kill. For a mini-computer, you can imagine getting close to 8 devices. And for something like a super-mini, in an intense computing environment—coupled with the need to control the types of external devices I mentioned earlier—you can see how you may need to have 12—or 15—or more devices under your control, each with logical units performing their assigned tasks.

**PR:** You're referring to real-time clocks, communications gateways, hard disks, tapes, real-time feed-back mechanisms, external sensors, burglar alarms, co-processors, and so forth all stuck on SCSI/PLUS.

**RL:** Yes. That's precisely the concept we had in mind, and our SCSI/IOP is the ideal product for use to create a mass-device implementation of the SCSI/PLUS bus. We can make the IOP invisible on the bus and not run out of address space.

The host computer would be able to talk to SCSI devices—disks, tapes and controllers—and the host will be able to talk to SCSI/PLUS devices. If you picture our 186 PC-DOS board, for instance, as the host, linked to other 186 boards performing multi-tasking and other computing operations, and our IOP board controlling external devices, you can very easily have 56 devices on the SCSI-PLUS bus, plus 8 devices under the SCSI side—without any conflict in address space.

SCSI/PLUS devices have their own way of being accessed, and SCSI devices have theirs. So, if the host can talk both of these languages—being bilingual—we can have a jumper on our board that can be placed one way for accessing SCSI devices, and jumpered the other way to talk only to SCSI/PLUS devices. And as long as the host has the drivers to talk to these devices, then our devices don't place a burden on the SCSI address space.

We benefit from the silicon that's been developed, because it only takes one chip—the NCR 5380 on each device. And that's pretty decent. How many buses do you know that can be established with the kind of protocol support this chip has? So, we've seized on the silicon that's been developed for the purpose of mass storage and have created the first standard Parallel I/O bus for accessing every conceivable device.

As you know, there aren't any ubiquitous parallel I/O buses available. The RS422 is very limited in ability and very slow. But SCSI/PLUS has the advantage of high speed; it has the advantage of standard silicon; and it has the advantage of flexibility for mixing both mass storage and I/O on the same bus.

**PR:** Getting back to the SCSI/IOP for a moment. You mentioned that it is the ideal product with which to access external devices. You also mentioned that SCSI/PLUS is a way of opening the architecture of closed systems. Does this mean that the SCSI/IOP can interface to a closed system such as the Macintosh and allow it to be used as a host for industrial devices, as well as allow itself to be linked to your 186 PC-DOS board, or an IBM—or any computer that has a SCSI/IOP on to it?

**RL:** I'm glad you mentioned this, because it provides an illustration for what I've been telling you. The NRC 5380 and SCSI/PLUS are not microprocessor dependent in the sense that CP/M would only run using a Z80 chip. The 5380 and SCSI/PLUS are protocol devices that are accessed by software drivers. We have SCSI/PLUS on our CP/M board, as well as on our 186 board which uses the Intel 80186 CPU. Yet, both boards can reside on the same bus, each performing their respective tasks. The 68000 CPU used in the Mac, the new Atari ST series and the Commodore Amiga can use our SCSI/IOP to create a simple interface for communicating with an IBM-PC, XT or AT also outfitted with our IOP.

Right now, some manufacturers have created expensive boxes for the Mac and the Amiga to run PC-DOS. What they've actually done is to attach a co-processor. If you have this device on a Mac, you can toggle into the IBM mode and run IBM software. But why bother? It's the same as buying an IBM and sitting it on the desk next to you. You're still stuck with one mode or the other.

What SCSI/PLUS will allow you to do is simply this. You can hook up your Mac, your IBM, your Atari, your Amiga—or whatever computer system you have (including your old 8-bit work horses)—and have them share all your mass storage devices, your printers, modems, communications systems. And, as long as the program you run on each machine can create an ASCII text file of their data, then any machine can access the data from any other computer.

This may be hard to imagine. But it is a fact. The 5380 protocol is accessed by software. As long as you have written a driver—or series of drivers—for each computer to allow access to other computers on the system, or the devices I've just mentioned—then they will work together. And you don't need a costly hardware interface costing $500 or $1,000.

**PR:** Are you planning any commercial application of the SCSI/IOP to provide a bridge between the Mac and the IBM?

**RL:** If you mean, are we going to develop the software to accomplish this and sell through retail markets? Then the answer is no. We're not geared for this type of operation. We're selling the SCSI/IOP to other manufacturers who are preparing their own drivers. We supply an extensive support software base with the IOP. Not only are there demo drivers, but the Source to simplify the preparation of specific drivers. The system integrator merely has to add the specific code for his implementation and get it into the market. In quantity form, the IOP sells for less than $100, so an OEM or VAR with an established retail base can, with minimal effort, integrate the board into his application product and sell it at a competitive price.

**PR:** I read in some recent literature that NCR is distributing on the 5380 chip, that they have included Ampro's SCSI/PLUS architecture in the documentation. Does this constitute an endorsement for SCSI/PLUS.

**RL:** For the most part. We've worked together with some of NCR's engineers. I also co-wrote an article for *Digital Systems*, about a year ago, with Harold Mason, Sr., an Applications Engineer of NCR's Microelectronics Div., about implementing SCSI/PLUS with the 5380 chip.

There's another company here in the valley—whose name I shouldn't mention—who is thinking of making a 5380 compatible chip, and they're looking at our SCSI/PLUS in order to make the chip special. I think that they, and some other firms, are beginning to realize that the kind of storage and I/O devices we will have available in the near future will benefit from—or need—a universal Parallel I/O bus of this kind. In the past, it used to be quite unruly. Everyone had their own custom interfaces, and standards were hard to define. Ultimately everyone capitulated and some standards were created: The Centronic parallel printer interface, the RS232C serial interface, the SASI hard disk interface. Then SCSI, which is a superset of SASI. SCSI/PLUS embraces all of these devices, as well as industrial I/O devices, all on one ribbon cable.

I would like to see SCSI/PLUS become the industry standard for all single board computer systems, because it provides for an inexpensive way to open the architecture of otherwise closed systems. It could be on the back of every computer, as it will be on every mass storage device. Right now, most single board computers have some kind of expansion connector to interface to I/O boards. But each manufacturer still has his own perculiar way of doing this. As such, I/O devices designed for one computer won't necessarily work on any other. What SCSI/PLUS will accomplish, if others follow suit, is to create a standard whereby an A/D converter or a data acquisition device from one manufacturer will work with any single board computer on the market.

**PR:** I assume, then, that all future Little Boards will have the SCSI/PLUS interface?

**RL:** Yes. We've had too much of a challenge creating the standard, and we want all of our customers—whether they have an 8-bit or 16-bit Little Board, or whatever boards we have planned for the future, to be able to still function as part of the systems they've built for the businesses or industrial plants, without feeling the pinch of product obsolescence.

**PR:** Who would you say is your biggest supporter within the SCSI circle of hard disk and controller manufacturers?

**RL:** That would be Larry Boucher, the Chairman of Adaptec. Larry is one of those visionaries who thinks in broad application terms. He was on the design team at IBM that created the IBM I/O bus in the late 70s. When he moved to Shugart Associates, he created the SASI architecture, and later was instrumental in starting up the SCSI specifications before he moved on to start his own company.

About 18 months ago, when I completed the preliminary SCSI/PLUS proposal, I called him up and told him that we had something that would probably interest him. Maybe he heard of Ampro, and told us to come over. Anyway, Bill (William I. Dollar, Ampro's President) and I went to see him, and I handed him an overview entitled a "SCSI Opportunity." When he got to the middle of the page, he began to smile. The more he read, the bigger the smile got.

Finally, he said, "I like it. Let's do it." He's been real supportive of us ever since. He reviewed the final SCSI/PLUS proposal before we presented it to the ANSC Committee, and helped make various industry connections for us.

**PR:** What about support from the rest of the SCSI manufacturers?

**RL:** The support has been fairly decent, especially from those who see the potential of SCSI/PLUS as a universal I/O bus. It takes time, as you have to give people the opportunity to digest the concept. I've attended the ANSC SCSI Forums, and talked about SCSI/PLUS. Typically, it falls on deaf ears at these forums, and committees are conservative by nature. They don't usually react until there is a clamoring of requirements in the market, or until someone shows it will cause a problem if they don't add it.

Everyone has their own perspective and dedication to their products—just as we do. But I feel very confident that SCSI/PLUS will become the standard I/O bus of the future. The clamoring for more than just mass storage will come. And when it comes, everyone will want the solution now.

The debate for SCSI and SCSI/PLUS is just beginning. It will be interesting to see what the developments will be. I plan to keep abreast of the situation and report on it from time to time.

Those who are interested learning more about SCSI/PLUS, may be pleased to know that Ampro's Rick Lehrbaum writes a SCSI/PLUS column for the *Computer Journal*, 190 Sullivan Crossroad, Columbia Falls, Montana 59912, in which he discusses hardware specific applications and software drivers, and demonstrates how to implement them.

Ampro's SCSI/PLUS Technical Specification Manual is available for $5.00 from:

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# Bulletin Board

**The Bulletin Board** is a regular feature of the *Computer Shopper*. This is where you can list your public access community bulletin board or Remote System at no charge. All listings are in area code sequence. If you would like to have your Remote System listed, follow the instructions listed below:

**Submission Policy**

All Bulletin Board entries must be submitted in **writing** by the first Monday of every month. **Submissions received by the first Monday of November will appear in the January issue.** The listing will be good for three issues thereafter unless it cannot be verified.

**PRACSA** (Public Remote Access Computer Standards Association, (415)948-2513) and **FOG** (P. O. Box 3474, Daly City, CA, 94015) are organizations devoted to the enhancement of the computer experience. Therefore members of these two organization are now assisting in the maintenance and verification of entries in **The Bulletin Board**.

A large percentage of the listings received have been voice numbers not associated with Remote Systems. This is an inconvenience for owners of the phone numbers which must be eliminated.

**FOG** and **PRACSA** members will attempt to verify each listing at least once every three months. If a listing is found to be inaccurate, it will immediately be deleted from the listing. If an update report is not received every three months, the listing will also be deleted. All SysOps are responsible for promptly forwarding accurate information to:

*Computer Shopper*
The Bulletin Board
P. O. Box F
Titusville, FL 32781

**We are not responsible for errors published in these listings.**

(201)239-1445, **Whips and Chains** -- Verona, NJ. 3/12/24 baud, online 24 hrs. SysOp: Unknown.
(201)290-1349, **Omegammon DBBS** -- Matawan, NJ. 3/12/24 baud, online 24 hrs. SysOp: John Ross. IBM and Compatibles.
(201)297-7399, **Pan World Internat.** -- North Brunswick, NJ. 300/1200 baud, online 24 hrs. SysOp: Alex Fongbin. IBM-PC, Apple, Mac, Commodore, CP/M.
(201)352-6118, **MIDI Apple Users Group** -- Elizabeth, NJ. unknown baud, online 7pm-7am,24hrSS. SysOp: Maria Rios. Apple.
(201)370-8021, **The Syndicate** -- Larelwood, NJ. 300/1200 baud, online 24 hrs. SysOp: W Miller.
(201)376-6581, **Sigma BBS** -- Millburn, NJ. 300 baud, online 24 hrs. SysOp: Unknown. Apple IIc.
(201)379-1459, **Skull Island BBS** -- Millburn, NJ. 300 baud, online 24 hrs. SysOp: John Patuto. Atari.
(201)379-5882, **The Thieves Guild** -- Westfield, NJ. 300/1200 baud, online 24 hrs. SysOp: Dave Grabowski. Commodore C64/C128.
(201)381-4107, **Tele-Master:Speed-Line** -- ????, NJ. 300/1200 baud, online 24 hrs. SysOp: Gary Spiewak. Ring Back (Let ring once, and then call back).
(201)467-2739, **FOG -41** -- Elizabeth, NJ. 300/1200 baud, online 24 hrs. SysOp: George Porcella. Jersey Osborne Group (FOG AMO #138) member supported system. **PRACSA member**
(201)494-3558, **Transmission Relay Stn** -- Edison, NJ. 300/1200 baud, online 24 hrs. SysOp: David Risack.
(201)494-3649, **Micro-Fone (MFTBBS)** -- Metuchen, NJ. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(201)494-8666, **Brainy Boro BBS (BBBS)** -- Metuchen, NJ. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(201)654-1680, **Attic-Static** -- Westfield, NJ. 300 baud, online 24 hrs. SysOp: Unknown.
(201)689-0492, **Xanth ST BBS** -- Washington, NJ. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Atari 520ST.
(201)743-4850, **Flash-Talk** -- Bloomfield, NJ. 300 baud, online 24 hrs. SysOp: Unknown.
(201)848-8217, **FOG -49** -- Wycoff, NJ. 3/12/24 baud, online 24 hrs. SysOp: Peter Zuroff. **PRACSA member**
(201)861-7680, **InterCHAT** -- North Bergen, NJ. 300 baud, online 24 hrs. SysOp: Unknown.
(201)891-0276, **Devil's Tower BBS** -- Wyckoff, NJ. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari 800XL.
(201)920-2353, **Caddy Shack** -- Bricktown, NJ. 300/1200 baud, online 24 hrs. SysOp: Rich Lowenburg.
(201)928-9488, **Coco Creations BBS** -- Jackson, NJ. 300/1200 baud, online 24 hrs. SysOp: Howard Wolk.
(201)944-0167, **Electronic Exchange** -- Fort Lee, NJ. 300/1200 baud, online 24 hrs. SysOp: Bob Bennett.
(201)944-4058, **The Attic BBS** -- Fort Lee, NJ. 300/1200 baud, online 24 hrs. SysOp: Peter Bennett.
(201)962-4956, **Skylands BBS** -- Ringwood, NJ. unknown baud, online ?? hrs. SysOp: Ed Narwid.
(201)972-8731, **Beyond Reality** -- Morganville, NJ. 300 baud, online 24 hrs. SysOp: Unknown.
(203)637-1378, **Andromeda BBS** -- Riverside, CT. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(203)698-0588, **The Ark** -- Old Greenwich, CT. 3/12/24 baud, online 24 hrs. SysOp: Jim Bolster.
(203)848-7942, **Oakdale CP/M PBBS** -- Oakdale, CT. 3/12/24 baud, online 24 hrs. SysOp: Lester Osborne.
(204)687-8665, **Data & Security System** -- Flin Flon, Manitoba. 300/1200 baud, online 24 hrs. SysOp: Nick Berzenji.
(204)832-4593, **Muddy Water Osborne Gp** -- Winnipeg, Manitoba. unknown baud, online 24 hrs. SysOp: Terry Smythe. Serious CP/M.
(205)343-1933, **Forum 80** -- Mobile, AL. unknown baud, online ?? hrs. SysOp: Unknown.
(205)626-7447, **Pep's Data Service** -- Mobile, AL. unknown baud, online ?? hrs. SysOp: Unknown.
(205)826-6053, **The Apple Group** -- Auburn, AL. unknown baud, online ?? hrs. SysOp: Unknown.
(205)969-2416, **The Alley Music RBBS** -- Birmingham, AL. 300/1200 baud, online 24 hrs. SysOp: John Sudderth.
(206)244-0359, **Fido in Broken Window** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Robert Phiel. Supplies and supports all systems.
(206)347-0243, **Public Domain Silo** -- Everett, WA. 300/1200 baud, online 24 hrs. SysOp: M Marean. C-128 & Amiga.
(207)532-6287, **The Sacug BBS** -- Houlton, ME. 300 baud, online 9pm-1am, M-F. SysOp: Robert Reece. Commodore.
(207)865-3004, **Acorn Message Exchange** -- Freeport, ME. 3/12/24 baud, online 24 hrs. SysOp: Anthony Cremonese.
(207)867-2241, **Mid-Coast Maine BBS** -- North Haven, ME. 300/1200 baud, online 9p-noonF&SaEDT. SysOp: Richard Winslow.
(209)474-3436, **Bullseye BBS** -- Stockton, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. FIDO system -- registration required. MS-DOS shareware.
(209)998-5830, **Flea Lemoore** -- Lemoore, CA. 300/1200 baud, online 8pm-7am. SysOp: Vincent McKever. Buy, Sell, & Trade.
(212)250-7090, **Tele-Master:Packetof-NY** -- ???? , NY. 300/1200 baud, online 24 hrs. SysOp: Bill Schimoler.
(212)489-7370, **FOG -15** -- New York City, NY. 300/1200 baud, online 24 hrs. SysOp: Livingston Hinkley. New York Osborne Users' Group (FOG AMO #135) member supported system. **PRACSA member**
(212)885-0969, **Tele-Master:Women's BB** -- ????, NY. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(213)698-3306, **The Dark Side** -- Whittier, CA. 300 baud, online 24 hrs. SysOp: Brendon Westhave.
(214)270-6755, **Super CPU** -- Mesquite, TX. 300/1200 baud, online 24 hrs. SysOp: Joe Coker. Sports conferences.
(214)357-6446, **Thieve's Underground** -- Dallas, TX. unknown baud, online 24 hrs. SysOp: Unknown.
(214)784-2273, **The Sand Worm RBBS** -- Paris, TX. 3/12/24 baud, online 24 hrs. SysOp: Steve Clifford.
(215)288-0262, **PHUG BBS** -- Philadelphia, PA. 300/1200 8N1 baud, online 24 hrs. SysOp: Rob Cohan. Heath/Zenith & PC Compatible.
(215)434-3998, **Hermes-84** -- Allentown, PA. 300/1200 baud, online 24 hrs. SysOp: Brice Remaley.
(215)698-1905, **Tele-Master: Satronics** -- Philadelphia, PA. 3/12/24 baud, online 24 hrs. SysOp: Mark Miller.
(215)965-8331, **Hermes-128** -- Allentown, PA. 300/1200 baud, online 24 hrs. SysOp: Brice Remaley.
(216)327-1099, **Timex Sinclair Users** -- Elyria, OH. unknown baud, online 24 hrs. SysOp: Thomas Simon. Supporting Sinclair and other computers.
(216)729-0625, **The Twin Paradises** -- Cleveland, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown. TRS-80 and Atari.
(216)784-5793, **The Oven BBBS** -- Akron, OH. 300 baud, online 24 hrs. SysOp: Eric Lazar.
(216)944-1072, **TIBBS-Northcoast 99's** -- Cleveland, OH. unknown baud, online ?? hrs. SysOp: Earl Blewitt. TI/99.

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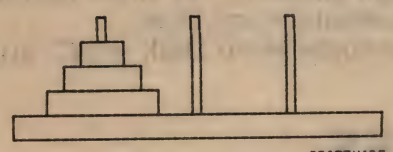


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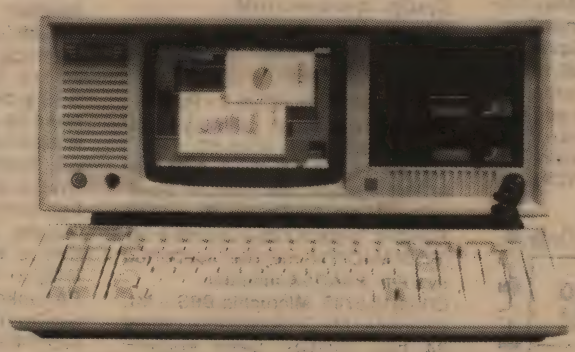

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# Bulletin Board

(216)953-0336, **The Plains of Abyss** -- Willoughby, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(217)344-4032, **FOG -14** -- Urbana, IL. 300/1200 baud, online 24 hrs. SysOp: Jonathan Block. **PRACSA member**
(217)892-8889, **Network: Atari** -- Rantoul, IL. unknown baud, online 24 hrs. SysOp: Jeff Look. Atari.
(219)422-9180, **The Night Gallery** -- Fort Wayne, IN. 300/1200 baud, online 24 hrs. SysOp: Unknown. C-64.
(219)447-2233, **The Warehouse** -- Fort Wayne, IN. 300/1200 baud, online 24 hrs. SysOp: Kenneth Uhrick. C-128 (C-64 mode).
(301)229-1516, **Micro-City** -- Bethesda, MD. unknown baud, online 9pm till morn. SysOp: Eric Smith.
(301)340-1058, **Arcadia** -- Rockville, MD. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari 130XE.
(301)869-4354, **New FBI BBS** -- Gaithersburg, MD. 300/1200 baud, online 24 hrs. SysOp: David Overeem. Atari 800.
(302)654-2900, **Starfleet Command** -- Elsmere, DE. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Sci-Fi Echomail.
(302)737-7788, **The MouseTrap Pro** -- Newark, DE. 3/12/24 baud, online 24 hrs. SysOp: Online Publishing O. Apple IIE.
(303)369-8397, **Stock Market BBS** -- Denver, CO. 3/12/24 baud, online 24 hrs. SysOp: Jim Pritula. Financial Data -- On Line Trading.
(303)392-9635, **Cobra Command Post -1** -- Colorado Springs, CO. 300/1200 baud, online ?? hrs. SysOp: Unknown.
(303)458-6248, **Control Systems BBS** -- Denver, CO. 10/20 baud, online 24 hrs. SysOp: Lupe Ramirez. IBM-PC.
(303)471-2415, **FOG -45** -- Colorado Springs, CO. 300/1200 baud, online 24 hrs. SysOp: Ken Moon. Colorado Springs Osborne Group (FOG AMO #133) member supported system. **PRACSA member**
(303)472-0902, **Control Headquarters** -- Colorado Springs, CO. 300 baud, online 24 hrs. SysOp: Unknown.
(303)520-9472, **Kastle Krack** -- Colorado Springs, CO. unknown baud, online ?? hrs. SysOp: Unknown.
(303)548-9519, **Elite Connection** -- Colorado Springs, CO. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(303)574-2567, **Villa-TI** -- Colorado Springs, CO. 300/1200 baud, online ?? hrs. SysOp: Joe Nuvolini. TI-99/4a.
(303)576-8325, **Dream Worldd** -- Colorado Springs, CO. 300/1200 baud, online ?? hrs. SysOp: Unknown.
(303)594-0256, **Air Transit** -- Colorado Springs, CO. 300/1200 baud, online ?? hrs. SysOp: Unknown.
(303)699-6517, **The Proving Grounds** -- Denver, CO. 300/1200 baud, online ?? hrs. SysOp: Unknown.
(304)927-1773, **Liberty Bell Network** -- Royal Oak, MI. unknown baud, online 24 hrs. SysOp: Unknown.
(305)439-2136, **The Fortune Cookie BBS** -- Lake Worth, FL. 3/12/24 baud, online 12pm-8pm. SysOp: Blake Levy. IBM.
(305)671-5913, **The Pigsty** -- Winter Park, FL. 3/12/24 baud, online 24 hrs. SysOp: Richard Marlowe.
(305)722-4321, **ComNet-64 BBS II** -- Tamarac, FL. unknown baud, online 24 hrs. SysOp: Dan Volin. Commodore.
(305)726-4390, **ComNet-64 BBS** -- Tamarac, FL. unknown baud, online 24 hrs. SysOp: Anne Herold. Commodore.
(305)734-6026, **Atari CC of Palm Beach** -- Palm Beach, FL. 300 baud, online 24 hrs. SysOp: Unknown. ATASCII only -- Atari Computer Club of the Palm Beaches.
(305)773-5033, **Computer Hustler BBS** -- Eaugale, FL. 300/1200 baud, online ?? hrs. SysOp: Paul Heim. Tandy 1000 and IBM.
(305)793-2975, **Alternate Universe** -- Palm Beach, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown. ATASCII only -- Atari Computer Clubs of the Palm Beaches.
(305)981-8173, **Eagle's Nest BBS** -- Hollywood, FL. 3/12/24 baud, online 24 hrs. SysOp: Dan Schoenbaum.
(306)949-1564, **Onyx RCP/M** -- Regina, Sask. 300/1200 baud, online 24 hrs. SysOp: Cris Ball. FOG Remote System #50. **PRACSA member**
(309)755-6684, **The Trading Post** -- East Moline, IL. 300/1200 baud, online 8pm-2pm. SysOp: Kim Ellis.
(312)235-7902, **CFOG -2** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Bill Kuykendall. Chicago FOG (FOG AMO #80) member supported system. **PRACSA member**
(312)252-2136, **Logan Square** -- Chicago, IL. unknown baud, online ?? hrs. SysOp: Earl Bockenfeld.
(312)282-9272, **Ski's Lodge** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Ken Morrison.
(312)326-4392, **CPM3 RCP/M** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Dick Lieber.
(312)359-8080, **Palatine RCP/M** -- Palatine, IL. 300/1200 baud, online 24 hrs. SysOp: Tim Cannon.
(312)384-0013, **Xerox Midwest** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: David Lowy.
(312)384-2320, **CACHE Lobo-80** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(312)420-1722, **DigiTec Znode (tm)** -- Lisle, IL. 3/12/24 baud, online 24 hrs. SysOp: Unknown.
(312)430-4477, **The Switchboard** -- Hickory Hills, IL. 300 baud, online 24 hrs. SysOp: Ken Morrison.
(312)459-9331, **Incomm's Turbo Board** -- Wheeling, IL. 3/12/24 baud, online ?? hrs. SysOp: Brad Grinstead. IBM.
(312)545-8086, **CBBS -1** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Unknown.
(312)649-1730, **Z-System Znode (tm)** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(312)690-3808, **Ampro 4 RCP/M** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Jim Mills.
(312)729-0556, **Ham Radio BBS** -- Chicago, IL. 300 baud, online ?? hrs. SysOp: Unknown.
(312)729-2101, **IBMPC/Business BBS** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Les Multack.
(312)769-2020, **20/20 BBS** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown. Commodore.
(312)773-3308, **Nessy** -- Itasca, IL. 300 baud, online 8am-1am. SysOp: Ken Morrison.
(312)789-0499, **Hinsdale RCP/M** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Mark Pulver. $$$$ Subscription service only.
(312)848-3669, **Apple SIG 'Cider Press** -- Chicago, IL. 300 baud, online 24 hrs. SysOp: Larry McMahon.
(312)849-1132, **Dolton CBBS** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Ward Christensen.
(312)896-9628, **The B.A.S.I.C. BBS** -- Aurora, IL. 300-1200 baud, online 3pm-11pm. SysOp: Steven Lorenz. TRS-80.
(312)897-6532, **Computer Solutions** -- Aurora, IL. 300/1200 baud, online 24 hrs. SysOp: Bill Slaker.
(312)922-3626, **XNX** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown. IBM.
(312)983-5147, **Sun Valley RCP/M** -- Lisle, IL. 3/12/24 baud, online 24 hrs. SysOp: K Stritzel.
(313)334-8877, **The Club II** -- Pontiac, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari ST, TRS.
(313)443-0365, **DeFOG's RBBS-RCP/M** -- Detroit, MI. 300/1200 baud, online 24 hrs. SysOp: Bill Rice. FOG Remote System #26 -- Detroit FOG (FOG AMO #14) member supported system. **PRACSA member**
(313)949-6745, **Microchip BBS** -- Mt. Clemens, MI. 3/12/24 baud, online 24 hrs. SysOp: Dave Marker. Downloads for all computers.
(313)978-1685, **Magic-Amis BBS** -- Warren, MI. unknown baud, online 24 hrs. SysOp: M. Lechkun. Atari.
(317)452-1535, **Bible Bulletin Board** -- Galveston, IN. 3/12/24 baud, online 24 hrs. SysOp: Tony Capoccia.
(317)482-1079, **The Gatorboard** -- Lebanon, IN. 300/1200 baud, online 10pm-8am. SysOp: Derk Gates. TRS-80 Color Comp.
(319)326-3904, **FOG -25** -- Davenport, IA. 300/1200 baud, online 24 hrs. SysOp: Matthew Reed. Quad City Osborne Group (FOG AMO #102) member supported system. **PRACSA member**
(403)280-9900, **Formula Coco** -- Alberta, Canada. 300/1200 baud, online 24 hrs. SysOp: Bill Boogaart. 7 bit, Even parity.
(404)354-0662, **FOG -27** -- Athens, GA. 300/1200 baud, online 24 hrs. SysOp: Bob Herrin. Computer User Group of Athens (FOG AMO #81) member supported system. **PRACSA member**
(404)546-8256, **Channel 33** -- Athens, GA. 300 baud, online 24 hrs. SysOp: Ric Helton. Atari.
(404)934-0188, **Atlanta Computer Soc.** -- Atlanta, GA. unknown baud, online ?? hrs. SysOp: Unknown.
(405)848-5317, **Constitutional Pathway** -- Oklahoma City, OK. 300/1200 baud, online 24 hrs. SysOp: Whitney Boutin. FOG Remote System #13 -- Oklahoma CP/M Users' Group (FOG AMO #67) member supported system. **PRACSA member**
(408)238-9621, **Servu** -- San Jose, CA. 3/12/24 baud, online 24 hrs. SysOp: Al Mehr. CP/M80, CP/M86, Macintosh, PC-DOS, MS-DOS software. **PRACSA member**
(408)245-1420, **ZEE Machine** -- Sunnyvale, CA. 3/12/24 baud, online 24 hrs. SysOp: Norman L. Beeler. Public Domain Software. **PRACSA member**
(408)253-1309, **Digikron Systems** -- San Jose, CA. 3/12/24 baud, online 24 hrs. SysOp: Douglas Thom. ZCPR3 & Apple CP/M & Macintosh. **PRACSA member**
(408)262-5150, **DC to Light** -- San Jose, CA. 300/1200 baud, online 24 hrs. SysOp: Fred Townsend. Heath/Zenith software, general interest. **PRACSA member**
(408)262-7177, **SpaceNET** -- Milpitas, CA. 300-1200 baud, online 24 hrs. SysOp: Bill Dale. Space Frontier SIG. **PRACSA member**
(408)354-5934, **Saratoga PBBS** -- Saratoga, CA. 300/1200 baud, online 24 hrs. SysOp: Chuck Metz. Public domain software and technical information exchange. **PRACSA member**
(408)378-7474, **Potpourri** -- San Jose, CA. 3/12/24 baud, online 24 hrs. SysOp: Wayne Masters. Engineering applications ¾ compilers ¾ assemblers ¾ disassemblers. Special software for registered SySops. **PRACSA member**
(408)559-8843, **MicroResearch Rem Sys** -- Campbell, CA. 300/1200 baud, online 24 hrs. SysOp: Mitchell Orysh. Software exchange. **PRACSA member**
(408)720-9212, **Bizcomp BBS** -- Sunnyvale, CA. 300/1200 baud, online 24 hrs. SysOp: Howard Stateman. Modem technical support. **PRACSA member**
(408)867-6575, **Eigenware (tm)** -- Saratoga, CA. 300/1200 baud, online 24 hrs. SysOp: Karl L. Remmler. BBS & Database for programmers. **PRACSA member**
(408)947-8038, **Wild Bill's** -- San Jose, CA. 300/1200 baud, online 24 hrs. SysOp: Bill Strouse. Trail Information Volunteer Center (TIVC) listing bicycle, jogging, and horse activities. **PRACSA member**
(412)321-7262, **Camelot** -- Pittsburgh, PA. unknown baud, online 24 hrs. SysOp: Davin Flateau.
(412)741-4232, **Biotechnology** -- Pittsburgh, PA. unknown baud, online 24 hrs. SysOp: Gary Dale.
(412)962-9514, **Beacon Hill BBS** -- Transfer, PA. 300/1200 baud, online 24 hrs. SysOp: Stephen Bross. Commodore.
(413)774-5751, **Wizard's Domain** -- Greenfield, MA. unknown baud, online 10p6aM-F11p6aS. SysOp: Unknown. C-64.
(415)285-2687, **KAY*FOG** -- San Francisco, CA. 300/1200 baud, online 24 hrs. SysOp: Bond Shands. Novices and subject (dBASE, WordStar, MEX, etc) conferences -- mail registration required. **PRACSA member**
(415)323-4579, **SMOG3 (FOG 40)** -- Menlo Park, CA. 3/12/24 baud, online 24 hrs. SysOp: Philip A. Moore. SMOG3 (FOG AMO #68) member supported system. **PRACSA member**
(415)349-8245, **Cats Tail Headquarters** -- San Mateo, CA. 300/1200 baud, online 24 hrs. SysOp: Bill Bennett.
(415)364-3739, **Anatomically Correct** -- Atherton, CA. 300/1200 baud, online 24 hrs. SysOp: Howard Stateman. Adult interests. **PRACSA member**
(415)365-2650, **Emerald Lake (FOG 48)** -- Redwood City, CA. 3/12/24 baud, online 24 hrs. SysOp: Dick Worth. **PRACSA member**
(415)383-0473, **Marin RBBS** -- Mill Valley, CA. 300 - 710 baud, online 5p-8a (S/S 24). SysOp: Jim Ayers. CP/M and Otrona Attache. **PRACSA member**
(415)489-9005, **ZCPR3 BBS/Z-Node Centr** -- Fremont, CA. 3/12/24 baud, online 24 hrs. SysOp: David McCord. Source of ZCPR3 software & support. **PRACSA member**
(415)572-8219, **Kay*Fun** -- San Mateo, CA. 300/1200 baud, online 24 hrs. SysOp: Ernest Hintz. CP/M software and messages. System supported by Kayfun members. **PRACSA member**
(415)574-3663, **TechNet** -- San Carlos, CA. 3/12/24 baud, online 24 hrs. SysOp: Eric R. Daniel. MS-/PC-DOS software, communications, engineering, AutoCAD & ham radio SIGs. **PRACSA member**
(415)574-7684, San Mateo, CA. 300/1200 baud, online ?? hrs. SysOp: Unknown. San Mateo TRS-80 User Group BBS (8/N/1).
(415)591-6259, **FOG - 4** -- Belmont, CA. 3/12/24 baud, online 24 hrs. SysOp: Roy Robinson. CP/M & MS-DOS support. **PRACSA member**
(415)595-2479, **FAUG BBS** -- San Carlos, CA. 300/1200 baud, online 24 hrs. SysOp: Timothy Avery. Amiga owners.
(415)595-5079, **TechNet** -- San Carlos, CA. 3/12/24 baud, online 24 hrs. SysOp: Eric R. Daniel. MS-/PC-DOS software, communications, engineering, AutoCAD & ham radio SIGs. **PRACSA member**
(415)655-1206, **FOG -33** -- Oakland, CA. 300/1200 baud, online 24 hrs. SysOp: Kenji Nakadegawa. East Bay FOG (FOG AMO #3) member supported system. **PRACSA member**
(415)692-1406, **MEBBS (FOG 31)** -- Burlingame, CA. 3/12/24 baud, online 24 hrs. SysOp: Jim Switz. FOG support, customer support.
(415)692-1861, **WestWind BBS** -- Millbrae, CA. 300/1200 baud, online 24 hrs. SysOp: Yati Sahae. Support of WestWind customers. **PRACSA member**
(415)755-2030, **FOG - 1** -- Daly City, CA. 3/12/24 baud, online 24 hrs. SysOp: Gale Rhoades. Distribution of FOG Disk Library. FOG or PRACSA membership required for access to download area. **PRACSA member**
(415)755-8315, **FOG - 6** -- Daly City, CA. 3/12/24 baud, online 24 hrs. SysOp: Jack Brown. Technical information and FOG uploads -- open to the public. **PRACSA member**
(415)792-3481, **FOG -38** -- Newark, CA. 3/12/24 baud, online 24 hrs. SysOp: Gerald Wright. **PRACSA member**
(415)845-2164, **Berkeley Mega-Monster** -- Berkeley, CA. 3/12/24 baud, online 24 hrs. SysOp: Tony Adams. CP/M and MS-DOS public domain software. **PRACSA member**
(415)851-7732, **King's Mountain** -- Woodside, CA. 300/1200 baud, online 24 hrs. SysOp: Troy Soult. FOG #12 -- mainly MS-DOS software. **PRACSA member**
(415)856-2771, **TeleTech** -- Palo Alto, CA. 300/1200 baud, online 24 hrs. SysOp: Freeman Bradford. Hobby. **PRACSA member**
(415)938-9470, **Co-Ed Associates** -- Walnut Creek, CA. 3/12/24 baud, online 24 hrs. SysOp: Werner L. Gumpert. Software exchange. **PRACSA member**
(415)948-2513, **PRACSA** -- Los Altos Hills, CA. 300/1200 baud, online 24 hrs. SysOp: Irv Hoff. PRACSA-member only system. **PRACSA member**


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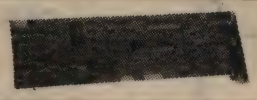

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(415)964-9039, **SPACE** -- Stanford, CA. unknown baud, online 24 hrs. SysOp: Jay Fox.
(415)965-4097, **Mt. View RCP/M** -- Mountain View, CA. 300/1200 baud, online 24 hrs. SysOp: Byron McKay. BBS open to the public. CP/M 80, 86, and 68K emphasis. **PRACSA member**
(417)864-8546, **The DGS'Express** -- Springfield, MO. 300/1200 baud, online 24 hrs. SysOp: David Stern. XModem Uploads and Downloads.
(417)869-5294, **The Computer Matrix** -- Springfield, MO. 3/12/24 baud, online 24 hrs. SysOp: James Morris.
(419)485-4681, **Stealth Base BBS** -- Montpelier, OH. unknown baud, online 8pm-8am (EST). SysOp: D. Dominique.
(501)224-9454, **ROSBBS LR** -- Little Rock, AR. 300/1200 baud, online 24 hrs. SysOp: Elmer Wingfield. CP/M-MS/DOS.
(501)470-0624, **C.I.A. BBS** -- Mayflower, AR. unknown baud, online 24 hrs. SysOp: Tim Grooms. Commodore.
(501)636-2281, **A.I.M. Online BBS** -- Rogers, AR. 300/1200 8N1 baud, online 24 hrs. SysOp: Jerry Hunter. MS-DOS -- Software exchange, realtime catalog of H/W & S/W at wholesale prices, electronic mail, etc.
(501)857-3138, **COBBS -41** -- Corning, AR. 1200 baud, online 8am-8pm (CST). SysOp: Perry Parsons.
(502)241-4109, **Soft Stone** -- Louisville, KY. 300/1200 baud, online 24 hrs. SysOp: Curt Edwards. FOG Remote System #24. **PRACSA member**
(502)439-4007, **Owl's Nest** -- Fort Campell, KY. unknown baud, online 24 hrs. SysOp: Unknown.
(502)439-6968, **Savage** -- Fort Campell, KY. unknown baud, online 24 hrs. SysOp: Unknown.
(502)885-5429, **Hacknet America** -- Hopkinsville, KY. 300/1200 baud, online 7pm-7am. SysOp: Unknown.
(503)754-1376, **Microtext** -- Corvalis, OR. 300/1200 baud, online 24 hrs. SysOp: Chuck Gee. $$$$ For profit system.
(503)839-1160, **Alton RCP/M** -- Eureka, CA. 3/12/24 baud, online 24 hrs. SysOp: Unknown. 8/N/1.
(504)348-4493, **WBUG II** -- New Orleans, LA. unknown baud, online ?? hrs. SysOp: Lionel Flotte.
(504)684-3244, **The Towne Crier BBS** -- Church Point, LA. 300 baud, online 9pm-6am. SysOp: Ricky Venable.
(504)769-4969, **BatonRouge Supersystem** -- Baton Rouge, LA. 300/1200 baud, online 24 hrs. SysOp: John Nastasi. Atari ST.
(504)851-4857, **The Curtain Call TBBS** -- Houma, LA. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(505)392-2447, **Midnight Thinking BBS** -- Hobbs, NM. unknown baud, online ?? hrs. SysOp: Bill Porter.
(507)931-5879, **Xanadu BBS** -- St. Peter, MN. 300 baud, online 24 hrs. SysOp: Unknown. Love Connection, Used Equiptment, Messages, News.
(512)592-1214, **The Trade-80 BBS** -- Kingsville, TX. unknown baud, online 24 hrs. SysOp: Bruce Claunch.
(513)335-2092, **Maverick Distributors** -- Troy, OH. unknown baud, online 6p7aM-F/24SaSu. SysOp: BMW & Associates B. Atari.
(513)372-3373, **Xenet Telecom BBS** -- Xenia, OH. 300/1200 baud, online 24 hrs. SysOp: Raymond Moore.
(514)487-2792, **Micro-Dial** -- Montreal, Canada. 300/1200 baud, online 24 hrs. SysOp: Leonard Fagen.
(514)684-4922, **Ozzie's FIDO** -- Roxboro, Quebec. 300/1200 baud, online 24 hrs. SysOp: Rene Champagne. FOG Remote System #47. **PRACSA member**
(515)673-3763, **The Skunk River Bullit** -- Oskaloosa, IA. unknown baud, online 24 hrs. SysOp: Unknown.
(516)289-0367, **Tele-Master: HQ** -- Patchogue, NY. 3/12/24 baud, online 24 hrs. SysOp: Trace Microsystems.
(516)349-7835, **Wise Byte BBS** -- Plainview, NY. 300/1200 baud, online 24 hrs. SysOp: Ron Clibnik. Atari.
(517)372-3131, **The Club** -- Lansing, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari ST, TRS.
(518)639-4490, **The HOST BBS** -- Fort Ann, NY. unknown baud, online 9a10pSa11a6pSu. SysOp: Ross Calloway.
(518)853-3195, **It's Another World** -- Fonda, NY. 300 baud, online 9pm-7am daily. SysOp: Rob Breuer.
(601)388-3673, **Payton's Place BBS** -- Biloxi, MS. unknown baud, online 24 hrs. SysOp: David Payton. Commodore.
(606)781-4478, **Ruppel-Set ][** -- Southgate, KY. 3/12/24 baud, online 24 hrs. SysOp: Ron Otto. MSDOS.
(608)255-2755, **Bits II** -- Madison, WI. 3/12/24 baud, online 24 hrs. SysOp: Brian Goldsworthy. Primarily Apple.
(609)227-8696, **KMMM Pascal BBS** -- Bellmawr, NJ. 300/1200 8N1 baud, online 24 hrs. SysOp: Willi Kusche.
(612)920-5566, **L5 MN Space BBS** -- Edina, MN. 3/12/24 baud, online 24 hrs. SysOp: Scott Shjefte.
(613)255-5836, **Diplomacy On-line** -- Ottawa, Ontario. unknown baud, online ?? hrs. SysOp: Unknown.
(614)863-6721, **Pentagon** -- Columbus, OH. 3/12/24 baud, online 24 hrs. SysOp: Unknown.
(615)292-0710, **FOG -23** -- Nashville, TN. 300/1200 baud, online 24 hrs. SysOp: Ernie Dryden. $$$$ Fee system unless member of MidTOG or NAOUG. **PRACSA member**
(615)358-9307, **Atari Castle** -- Clarksville, TN. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari only.
(615)387-2467, **Fort Apocalypse** -- Clarksville, TN. unknown baud, online 24 hrs. SysOp: Unknown.
(615)431-6857, **All's RCPM/MBBS** -- Fort Campell, KY. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(615)645-5299, **Okie Bug** -- Clarksville, Tn. 300 baud, online 7pm-11am (CST). SysOp: Ira Grims.
(615)852-4417, **The Skyline BBS** -- Five Points, TN. 300 baud, online 9pm-6am. SysOp: Kevin Cox.
(616)335-5119, **Multi-Board** -- Holland, MI. unknown baud, online 24 hrs. SysOp: Richard Brockmeier. TRS, IBM, Amiga, Apple.
(617)288-4667, **Bar-Ken (FOG 29)** -- Boston, MA. 300/1200 baud, online 24 hrs. SysOp: John Kinsella. Boston Osborne Group (FOG AMO #122) member supported system. **PRACSA member**
(617)875-3618, **Xevious** -- Framingham, MA. 300 baud, online 24 hrs. SysOp: Nels Anderson. Also (617)-449-7322, direct user chat.
(618)745-6163, **Computer Cellar BBS** -- Mounds, IL. unknown baud, online 24 hrs. SysOp: Greg Krempasky. Educational.
(619)326-4928, **Teen BBS** -- Needles, CA. 300 baud, online Saturdays. SysOp: Chuck Swan.
(703)786-6577, **Redline's Garage BBS** -- Fredericksburg, VA. 3/12/24 baud, online 24 hrs. SysOp: Joe McAllister.
(704)484-3019, **Diver's Domain BBS** -- Shelby, NC. 300/1200 baud, online 24 hrs. SysOp: Robert Stone. Commodore only -- uploading & downloading.
(704)552-7480, **XLR8ED BBS** -- Charlotte, NC. 300/1200 baud, online ?? hrs. SysOp: Joe Venturelli.
(704)728-8534, **Hudson Area C-64 BBS** -- Hudson, NC. 300/1200 baud, online 9p-4p/9p-8aS-S. SysOp: Benny Hayslett. C-64 Color/Graphic.
(707)557-4403, **Vallejo RCP/M (FOG 18)** -- Vallejo, CA. 300/1200 baud, online 24 hrs. SysOp: Ron Forsythe. CP/M and MS-DOS. **PRACSA member**
(707)964-7172, **MCAB** -- Fort Bragg, CA. 300/1200 baud, online ?? hrs. SysOp: Manuel Martinez.
(713)527-8566, **Montrose Mailbox** -- Houston, TX. 3/12/24 baud, online 24 hrs. SysOp: Osa Lott. 8/N/1.
(713)771-9422, **The Outdoors Man** -- Houston, TX. 300/1200 baud, online 7p-5aM-F/24S-S. SysOp: John Bennett.
(713)873-0403, **Info-Net/Police-Net** -- Houston, TX. 1200 baud, online 24 hrs. SysOp: Alan Bragg. Commodore C/64.
(714)772-4097, **Amiga-Line** -- Anaheim, CA. 300/1200 baud, online 24 hrs. SysOp: Tom Jacobsen. Amiga.
(714)778-0948, **RBBS-Anaheim** -- Anaheim, CA. 3/12/24 baud, online 24 hrs. SysOp: David Kleinschmidt. IBM-PC.
(716)627-3490, **Lake View Area TIBBS** -- Lake View, NY. unknown baud, online 24 hrs. SysOp: Rick Dase. TI.
(717)454-4220, **Mission:Impossible BBS** -- Hazelton, PA. 300 baud, online 24 hrs. SysOp: Rich Green.
(717)657-4992, **Wiz/Tib TI/99 BBS** -- Harrisburg, PA. 300 baud, online 24 hrs. SysOp: David Ratcliffe. TI/99.
(717)657-8699, **FOG -10** -- Harrisburg, PA. 3/12/24 baud, online 24 hrs. SysOp: George Peace. CP/M + software. **PRACSA member**
(718)743-2434, **EntrePlex** -- Brooklyn, NY. 300/1200 baud, online 24 hrs. SysOp: Larry Alexander. For Entrepreneurs.
(718)746-1140, **Tele-Master:Online Sys** -- ????, NY. 3/12/24 baud, online 24 hrs. SysOp: George Mihalios.
(718)963-2189, **Tele-Master: F.C.C.** -- ????, NY. 300/1200 baud, online 24 hrs. SysOp: Richard Ho.
(800)564-1656, **MCAB** -- Fort Bragg, CA. 300/1200 baud, online ?? hrs. SysOp: Manuel Martinez. California callers only.
(803)366-6235, **Critical Mass BBS** -- Rock Hill, SC. 3/12/24 baud, online 24 hrs. SysOp: John Threatt. Amiga, BBS-PC.
(803)591-0312, **Animated Prism** -- Spartanburg, SC. 300/1200 baud, online 6-12pM-Th24F-S. SysOp: Unknown. Spartanburg Commodore Users Group.
(804)747-0041, **Skeleton Island** -- Richmond, VA. 300/1200 baud, online ?? hrs. SysOp: Unknown.
(804)873-2316, **Master's Syslink** -- Williamsburg, VA. 300/1200 baud, online 24 hrs. SysOp: Unknown. TRS-80.
(804)874-5107, **The Weather BBS** -- Newport News, VA. 300/1200 baud, online 24 hrs. SysOp: Unknown. MS-DOS.
(804)877-7141, **Volksboard TBBS** -- Williamsburg, VA. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(804)898-7493, **Oxgate RC/PM** -- Williamsburg, VA. 300/1200 baud, online 24 hrs. SysOp: Unknown. CP/M.
(805)496-7093, **The Connector** -- Westlake Village, CA. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Dating and Networking.
(806)383-2270, **Golden Spread Data Exc** -- Amarillo, TX. unknown baud, online 24 hrs. SysOp: Herman Green. TI Users.
(808)254-3369, **Hawaii TRS80 U. G.** -- Honolulu, HI. unknown baud, online ?? hrs. SysOp: Alan Krassner. TRS-80.
(808)499-2258, **Superboard Two** -- Ewa Beach, HI. 300/1200 baud, online 24 hrs. SysOp: Gene Ponce. Commodore.
(812)429-0017, **Evansville KUG** -- Evansville, IN. unknown baud, online ?? hrs. SysOp: Unknown.
(813)372-9211, **The Floppy Zone ST** -- New Port Richey, FL. 300/1200 baud, online 24 hrs. SysOp: David Pflanzer. XL/XE, ST and IBM.
(813)786-5460, **'C'-Lion BBS** -- Clearwater, FL. 300/1200 baud, online 24 hrs. SysOp: George Lysy.
(813)856-5071, **The Inner Sanctum** -- Hudson, FL. 3/12/24 baud, online 24 hrs. SysOp: Rob&Carol Marlowe.
(813)862-8806, **Studio-64** -- Hudson, FL. 300/1200 baud, online 24 hrs. SysOp: Ralph LoBianco. A Commodore BBS & Online Store.
(813)962-1044, **The Wall BBS** -- Tampa, FL. 300/1200 baud, online ?? hrs. SysOp: Blair Hall. TRS-80 Model 4.
(815)874-8534, **Spectre III** -- New Milford, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(816)331-0021, **The Newsroom** -- Raymore, MO. 300 baud, online 24 hrs. SysOp: Jim Howard. Commodore C/64.
(816)331-5868, **Howard's BBS** -- Raymore, MO. 300/1200 baud, online 24 hrs. SysOp: Jim Howard. Tandy 2000.
(816)765-9306, **Barsoom BBS** -- Kansas City, MO. 3/12/24 baud, online 24 hrs. SysOp: John Carter. Atari only.
(816)827-3027, **Commodore Exchange Net** -- Sedalia, MO. unknown baud, online 24 hrs. SysOp: Eric Bartlett.
(817)569-2080, **The Compu-System** -- Wichita Falls, TX. 300 baud, online 24 hrs. SysOp: Unknown. Commodore C/64.
(817)766-3274, **The Lab** -- Wichita Falls, TX. 300 baud, online 24 hrs. SysOp: Unknown. Commodore C/64.
(817)855-9429, **The Zoot Suit** -- Wichita Falls, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(817)865-6352, **The Gate** -- Gatesville, TX. 300/1200 baud, online 24 hrs. SysOp: Bennett Hamilton. Atari.
(818)338-3625, **The Dark Side II** -- Whittier, CA. 300 baud, online 25 hrs. SysOp: Brendon Wasthave.
(818)446-5813, **Arm BBS** -- Arcadia, CA. unknown baud, online 24 hrs. SysOp: Bob&Kim Reynolds. Atari and All.
(818)766-6442, **The Hotline DataBoard** -- North Hollywood, CA. 3/12/24 baud, online 24 hrs. SysOp: Jon Badeaux. U.S. & European music, TV ratings, CD sales, online info re home video market, Video Take-Out.
(818)787-0156, **RBBS (Bondwell SIG)** -- Van Nuys, CA. 300/1200 baud, online 24 hrs. SysOp: Jon Bek. CP/M & MS-DOS.
(818)882-6045, **TUG-Net** -- Chatsworth, CA. 300/1200 baud, online 24 hrs. SysOp: Bob Koller. FOG Remote System #16 -- Technical User Group Network (FOG AMO #106) member supported system. **PRACSA member**
(818)954-0800, **The Underground RBBS** -- Burbank, CA. 3/12/24 baud, online 24 hrs. SysOp: Larry Shadle. Multi-interest, supporting IBM-PC and Compatibles.
(904)686-0094, **The Dreamland Express** -- Spring Hill, FL. unknown baud, online 24 hrs. SysOp: Charles Oppermann. Color Computer.
(904)788-4181, **Atari Trader** -- Daytona Beach, FL. 1200 baud, online 24 hrs. SysOp: James Delk.
(912)883-7297, **U.S.S. Saratoga** -- Albany, GA. unknown baud, online 24 hrs. SysOp: Maurice Tift.
(914)562-7837, **The AlterLink BBS** -- New Windsor, NY. 3/12/24 baud, online 24 hrs. SysOp: Rich Roos. IBM PC-XT,PC-Board.
(915)855-1333, **Joe's Board** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Joe Grossinger. Commodore.
(915)855-1503, **Hackers Hospice** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Joe Grossinger.
(916)222-2322, **Amazon BBS** -- Redding, CA. unknown baud, online 6pm-6am (PDT). SysOp: Julie Sullivan. Commodore.
(916)334-9059, **Humanx Commonwealth** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(916)361-0559, **Bill Board** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(916)392-7279, **Select** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(916)423-1316, **Great Escape** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(916)423-3987, **City of Grey** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(916)448-3837, **Access** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(916)965-3416, **Shadow Haven** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari.
(919)447-7601, **The Wizzards Den** -- Cherry Point, NC. 300/1200 baud, online ?? hrs. SysOp: J. Bradley. Punter UL/DL.
(919)556-7975, **The Third Wave** -- Raleigh, NC. 3/12/24 baud, online ?? hrs. SysOp: Ken Zipin. IBM/Apple/Commodore/Multi-User.
(919)779-6674, **Micro Message Service** -- Raleigh, NC. 3/12/24 baud, online ?? hrs. SysOp: Michael Stroud.


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# Users Groups

**The User Groups Section** is a regular feature of the *Computer Shopper*. This is where you can list your group's address at no charge. User Group listings are in state sequence followed by international groups. If you would like to have your group listed, follow the instructions listed below:

### Submission Policy

All User Groups Section entries must be submitted in writing by the first Monday of every month. **Submissions received by the first Monday of November will appear in the January issue.** The listing will be good for three issues thereafter unless it cannot be verified.

**FOG** (P. O. Box 3474, Daly City, CA, 94015) is an international organization devoted to improved end user support, regardless of the equipment used. In order to provide **FOG** members with information regarding a local club, FOG maintains records on all know groups. Part of that data is now being used to produce the listings in this **User Groups Section**. Groups which are a part of the **FOG** network are so noted.

If a listing is found to be inaccurate or if an update report is not received from the non-FOG groups every three months, the listing will be deleted. Each group should appoint one officer who is responsible for promptly forwarding accurate information to:

*Computer Shopper*
The User Groups Section
P. O. Box F
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**We are not responsible for errors published in these listings.**

**FOG AMO 63–Generic Users Info & Data Exchange**, 1426 'H' Street, Anchorage, AK, 99501, 907-338-1811
**FOG AMO 89–Ketchican CP/M Users Group**, c/o Duane H. Fisher Jr., 1182 Black Bear Road, Ketchikan, AK, 99901, 907-225-9249
**FOG AMO 83–Baranof Users' Group**, P. O. Box 1483, Sitka, AK, 99835, 907-747-8615
**FOG AMO 18–PENFOG**, c/o Kenai Peninsula Community Coll, Box 848, Soldotna, AK, 99669, 907-262-5801
**136-Birmingham Atari Comp Enthusiasts**, 4424 Fifth Avenue, Birmingham, AL, 35222
**FOG AMO 49–First Alabama O U G**, c/o Ed Burquez, 303 North Hwy 47, Columbiana, AL, 35051, 205-669-4396
**FOG AMO 125–North Alabama Osborne Users Group**, c/o John Heaman, 8705 Valley View Drive S.E., Huntsville, AL, 35802, 205-881-0377
**95-Huntsville AL Commodore Komp. Soc.**, P. O. Box 14356, Huntsville, AL, 35815
**137-Micropolis/Vector Graphics Users Gp**, 604 Springwood Circle, Huntsville, AL, 35803-1740, 205-881-1697
**141-Visual Computer User Group**, c/o Ray Dobbs, 4907 Alberta Road, Huntsville, AL, 35816-1103
**98-South Alabama Apple Users Group**, P. O. Box 8894, Mobile, AL, 36608-0894, 205-661-0931
**138-Mobile Color SIG**, c/o Steve Poates, 2056 South McVay Drive, Mobile, AL, 36605, 205-473-1049
**91-C.A.T.I. 9914A Users Group**, P. O. Box 11751, Montgomery, AL, 36111, 205-284-1804
**139-Mobile Kaypro Users Group**, 7230 Tara Drive, South Mobile, AL, 36619
**145-Arkansas Software Lending Library**, c/o L. Bland, P. O. Box 1837, Conway, AR, 72032, 501-329-6933
**146-Commodore Information Association**, P. O. Box 1755, Conway, AR, 72032
**FOG AMO 23–AFOG**, c/o Data-Tronics Corp., Box 853, Fort Smith, AR, 72902, U.S.A., 501-646-4617
**147-West Helena Micro-Computer U G**, P. O. Box 2184, West Helena, AR, 72390
**143-Douglas Computer User's Group**, P. O. Box 544, Douglas, AZ, 85608, 602-364-9604
**142-Adam 2 Apple Users Group**, P. O. Box 34056, Phoenix, AZ, 85067, 602-277-8511
**FOG AMO 100–Tempe Osborne Group**, P. O. Box 24627, Tempe, AZ, 85282, 602-969-2074
**105-Tucson Color Computer Users Group**, 9631 East Stella Rd, Tucson, AZ, 85730
**144-Sun Heath Users Group**, c/o E. R. Rogers, 4860 S. Rosetter Place, Tucson, AZ, 85730
**FOG AMO 35–Small Machine User's Group**, c/o Bill Houk, 6253 North Colonial, Fresno, CA, 93704, 209-431-0480
**FOG AMO 66–South Valley FOG**, c/o Olson Computer Services, 1502 North Lowery Street, Porterville, CA, 93257, 209-781-4123
**FOG AMO 11–Stockton Osborne Group**, c/o Rod Payne, 4600 N. Pershing Avenue #C, Stockton, CA, 95207-6789, 209-951-4701
**10-Stockton Commodore 64 Users Group**, c/o Yita McCann, 2929 Calariva Drive, Stockton, CA, 95204, 209-948-5890
**154-Le Sig**, 148 South Almont Drive, Beverly Hills, CA, 90211
**FOG AMO 130–Organ of Prof., Educators & Novices**, c/o Frank Christ, L.A.C. Cal State U Long Beach, Long Beach, CA, 90840, 213-498-4186 x 5350
**155-Los Angeles Amiga Users Group**, c/o Bill Simpson, 1711 Altivo Way, Los Angeles, CA, 90026, 213-661-7959
**164-South Bay Computer Education Group**, 3675 Torrance Blvd. Suite 202, Torrance, CA, 90503
**FOG AMO 1–First FOG of Silicon Valley**, c/o Glen W. Stinnett, 21240 Canyon View Drive, Saratoga, CA, 95070, 408-371-8699
**FOG AMO 5–Monterey Bay Area O U G**, c/o Freedom Fastprint, 178 Barbara Way, Watsonville, CA, 95076, 408-728-1416
**31-Bay Area MicroDecision User's Assoc**, P. O. Box 5152, Berkeley, CA, 94705, 415-658-0152
**73-Diablo Valley Commodore Users Group**, P. O. Box 27155, Concord, CA, 94527, 415-838-2838
**162-SCPCUG**, P.O. Box 7656, Fremont, CA, 94537-7656
**47-Diablo Valley Morrow Users Group**, c/o Bruce Kaufman, 3065 Rohrer Drive, Lafayette, CA, 94549-5646, 415-284-9335
**FOG AMO 68–San Mateo Osborne Group**, c/o Philip A. Moore, 1331 Crane Street, Menlo Park, CA, 94025, 415-325-2442
**37-East Bay Micromate Users' Group**, c/o Ed Miller, P.O. Box 402, Moraga, CA, 94556, 415-376-1611
**FOG AMO 31–Marin Osborne Group**, P. O. Box 1726, Novato, CA, 94948, 415-897-0629
**FOG AMO 3–East Bay FOG**, c/o Patricia Watters, 5497 Taft Avenue, Oakland, CA, 94618, 415-272-9099
**93-Bay Area Kaypro Users & Programmers**, P. O. Box 20181, Oakland, CA, 94620, 415-934-1927
**FOG AMO 2–San Francisco Computer Society**, c/o Ralph Gallagher, 2408 California Street, San Francisco, CA, 94115, 415-929-0252
**153-IBM XT Clone User Group**, 431 Ashbury Street, San Francisco, CA, 94117
**158-San Leandro Apple Eaters Users Grp**, c/o Bob Shayler, 2200 Bancroft Ave., San Leandro, CA, 94577
**48-Peninsula Kaypro Users Group**, c/o Ernest Hintz, P.O. Box 5405, San Mateo, CA, 94402, 415-593-9981
**FOG AMO 116–CP/M Users of Santa Cruz**, c/o Bernard Bricmont, 1920 Maciel Avenue, Santa Cruz, CA, 95062, 408-476-0504
**79-Stanford Palo Alto User Group**, P. O. Box 3738, Stanford, CA, 94305, 415-692-7181
**FOG AMO 60–Mt. Diablo Osborne Group**, c/o Larry's Booknook, 730 - A Bancroft Road, Walnut Creek, CA, 94598, 415-933-2665
**FOG AMO 114–High Desert Osborne Group**, c/o Daniel H. McClure, 74860 Base Line Street, Twentynine Palms, CA, 92277-3812, 619-367-2440
**FOG AMO 29–Humboldt Osborne Group**, c/o R C Electronics, P. O. Box 2751, McKinleyville, CA, 95521, 707-445-2074
**FOG AMO 56–North Bay FOG**, c/o Valley Oak Apts, 2600 North Coast Street, Santa Rosa, CA, 95401, 707-546-0145
**FOG AMO 6–Microcomputer U G of Solano & Yolo**, c/o Ron Forsythe, 450 Russell Street, Vallejo, CA, 94591, 707-557-5162
**FOG AMO 113–North Orange County Osborne SIG**, c/o Scott Cosel, 1675 Comstock Avenue, Los Angeles, CA, 90024-5320, 714-952-5627
**FOG AMO 47–Central Coast Osborne Group**, c/o Melvin Johnson, 1836 10th Street, Los Osos, CA, 93402, 805-528-2382
**163-Slo Bytes IBM PC User's Group**, c/o Bob Ward, 2100 Andre Avenue, Los Osos, CA, 93402
**150-Civic 64**, P. O. Box 2442, Oxnard, CA, 93034-2442
**151-Collaborative Steps/Heritage Hacker**, P. O. Box 163777, Sacramento, CA, 95816, 805-946-2125
**FOG AMO 69–Osborne Santa Barbara Users Group**, c/o Santa Barbara Co Audit Fiscal, 205 Vernal, Santa Barbara, CA, 93105, 805-687-8541
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**159-Sacramento PC Users Group**, P.O. Box 685, Citrus Heights, CA, 95610, 916-332-1944
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**72-Sacramento Commodore Computer Club**, P. O. Box 133393, Sacramento, CA, 95813-3393, 916-483-3558
**161-Sanyo MBC-2000/3000 Computer Club**, c/o River City Datamation, 2653 Yuma Circle, Sacramento, CA, 95827
**167-DEC Rainbow Users Group**, 2993 S. Peoria Suite 390, Aurora, CO, 80014, 303-671-0800
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**FOG AMO 133–Colorado Springs Osborne Group**, c/o James R. Sheldon, 2412 Sturgis Road, Colorado Springs, CO, 80909, 303-473-7647
**166-Computer C.A.C.H.E.**, 8692 E. Hampden Ave. P.O. Box 255, Denver, CO, 80231-4995
**169-TAWUG**, P.O. Box 24869, Denver, CO, 80222
**168-GRACE (Atari Computer Users)**, 1009 42nd Street #5, Evans, CO, 80620
**FOG AMO 115–Fort Collins Osborne Group**, P. O. Box 9522, Ft. Collins, CO, 80525, 303-226-4156
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**FOG AMO 40–Danbury Osborne Group**, c/o Marc Cohen, 23 Crestview Drive, Brookfield, CT, 06804, 203-775-1102
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**179-CP/M Users Group of Washington D.C.**, P.O. Box 891, Washington, DC, 20044-0891, 301-495-6690
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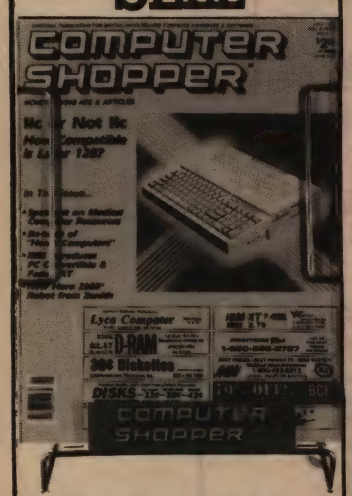


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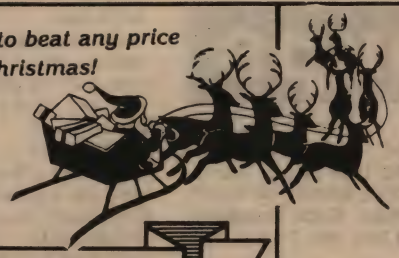

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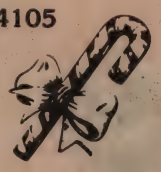

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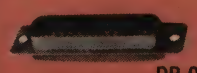
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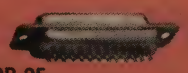

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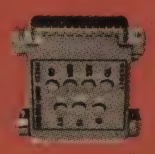
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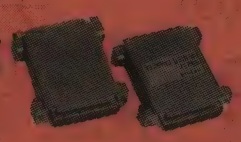

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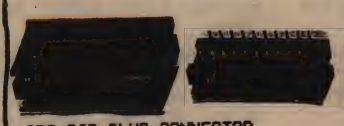
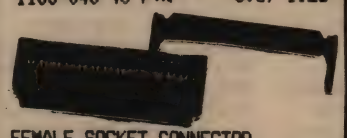


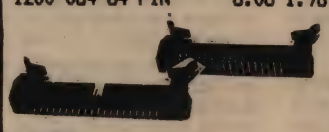
IDC DIP PLUG CONNECTOR

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 1100-014 14 PIN | 1.34 | .43 |
| 1100-016 16 PIN | 1.41 | .45 |
| 1100-018 18 PIN | 1.74 | .56 |
| 1100-020 20 PIN | 1.94 | .62 |
| 1100-024 24 PIN | 2.47 | .79 |
| 1100-028 28 PIN | 3.01 | .97 |
| 1100-040 40 PIN | 3.87 | 1.25 |



FEMALE SOCKET CONNECTOR

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 1200-010 10 PIN | 1.47 | .47 |
| 1200-014 14 PIN | 1.54 | .50 |
| 1200-016 16 PIN | 1.60 | .51 |
| 1200-020 20 PIN | 1.67 | .54 |
| 1200-026 26 PIN | 2.34 | .75 |
| 1200-034 34 PIN | 2.74 | .88 |
| 1200-040 40 PIN | 3.67 | 1.18 |
| 1200-050 50 PIN | 4.07 | 1.31 |
| 1200-060 60 PIN | 5.08 | 1.63 |
| 1200-064 64 PIN | 6.08 | 1.96 |

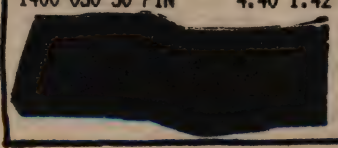


HEADER

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 1300-014S STRAIGHT | 1.59 | .51 |
| 1300-016S STRAIGHT | 1.79 | .51 |
| 1300-020S STRAIGHT | 1.91 | .61 |
| 1300-026S STRIAGHT | 2.46 | .79 |
| 1300-034S STRAIGHT | 3.25 | 1.05 |
| 1300-040S STRAIGHT | 3.81 | 1.23 |
| 1300-050S STRAIGHT | 4.76 | 1.53 |
| 13501-040 SINGLE/S | .52 | .48 |
| 13601-080 DOUBLE/S | 1.04 | .97 |
| 13701-040 SINGLE/R | .67 | .62 |
| 13801-080 DOUBLE/R | 1.34 | 1.25 |

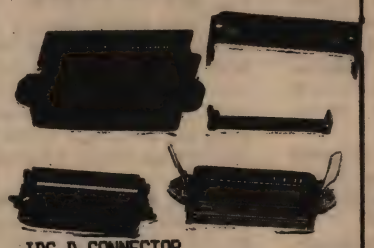
SLIM LINE CONNECTOR

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 1400-010 10 PIN | 1.06 | .34 |
| 1400-014 14 PIN | 1.23 | .40 |
| 1400-016 16 PIN | 1.40 | .45 |
| 1400-020 20 PIN | 1.76 | .57 |
| 1400-026 26 PIN | 2.28 | .73 |
| 1400-034 34 PIN | 3.17 | 1.02 |
| 1400-040 40 PIN | 3.51 | 1.13 |
| 1400-050 50 PIN | 4.40 | 1.42 |



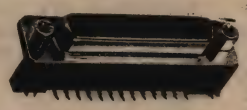
CARD EDGE CONNECTOR

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 1500-010 10 PIN | 2.07 | .67 |
| 1500-014 14 PIN | 2.14 | .69 |
| 1500-016 16 PIN | 2.21 | .71 |
| 1500-020 20 PIN | 2.27 | .73 |
| 1500-026 26 PIN | 2.54 | .82 |
| 1500-034 34 PIN | 2.61 | .84 |
| 1500-040 40 PIN | 3.87 | 1.25 |
| 1500-050 50 PIN | 4.88 | 1.57 |
| 1500-060 60 PIN | 7.01 | 2.26 |
| 1500-064 64 PIN | 7.48 | 2.41 |



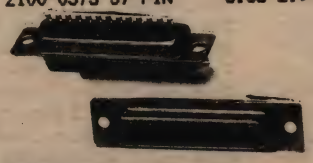
IDC D CONNECTOR

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 1600-025P IDC D | 5.41 | 1.74 |
| 1600-025S IDC D | 5.74 | 1.85 |
| 1700-036P IDC CENTRO | 6.35 | 2.04 |
| 1700-036S IDC CENTRO | 6.35 | 2.04 |



RIGHT ANGLE D CONNECTOR

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 2100-009P 9 PIN | 2.34 | .75 |
| 2100-025P 25 PIN | 3.67 | 1.18 |
| 2100-009S 9 PIN | 2.54 | .82 |
| 2100-015S 15 PIN | 3.34 | 1.07 |
| 2100-025S 25 PIN | 4.01 | 1.29 |
| 2100-037S 37 PIN | 6.35 | 2.04 |



SOLDER TYPE D CONNECTOR

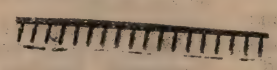
| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 2200-009P 9 PIN | 1.20 | .39 |
| 2200-009S 9 PIN | 1.34 | .43 |
| 2200-015P 15 PIN | 1.47 | .47 |
| 2200-015S 15 PIN | 1.69 | .54 |
| 2200-023P 23 PIN | 1.60 | .53 |
| 2200-023S 23 PIN | 1.80 | .57 |
| 2200-025P 25 PIN | 1.67 | .54 |
| 2200-025S 25 PIN | 1.80 | .58 |
| 2200-037P 37 PIN | 3.87 | 1.25 |
| 2200-037S 37 PIN | 4.28 | 1.38 |
| 2200-050P 50 PIN | 8.35 | 2.69 |
| 2200-050S 50 PIN | 9.22 | 2.97 |

PIN GRID ARRAY SOCKET

| | | |
|---|---|---|
| 550-068 | 7.00 | 2.24 |

CRIMPING HOUSE

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 2309-009P 9 PIN | 1.10 | .35 |
| 2300-015P 15 PIN | 1.25 | .40 |
| 2300-025P 25 PIN | 1.34 | .43 |
| 2309-009S 9 PIN | 1.18 | .38 |
| 2309-015S 15 PIN | 1.32 | .42 |
| 2309-025S 25 PIN | 1.47 | .47 |



CRIMPING CONTRACT

| DESCRIPTION | |
|---|---|
| 2300-001P MALE(1000) | CALL |
| 2300-001S FEMALE(1000) | CALL |

(1 ROLL IS 5000 PIN)

BACK SHELL

| DESCRIPTION | 1-24 | 25-50 |
|---|---|---|
| 2508-009 9 PIN | 1.14 | .37 |
| 2508-015 15 PIN | 1.27 | .41 |
| 2508-025 25 PIN | 1.60 | .51 |
| 2512-025 25 PIN | 1.80 | .58 |

(2-CR OVER COPPER PLATTING)

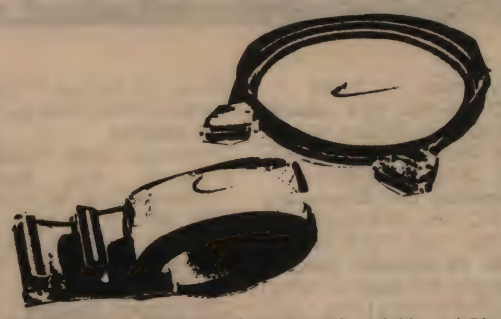
CENTRONIC TOP/SIDE ENTRY

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 3200-236P TOP ENTRY | 3.81 | 1.14 |
| 3200-336S TOP ENTRY | 5.81 | 1.74 |
| 3500-236P SIDE ENTRY | 4.28 | 1.28 |
| 3500-336S SIDE ENTRY | 6.41 | 1.92 |

I.C SOCKET SOLDER TYPE

| DESCRIPTION | 1-19 | 20-49 |
|---|---|---|
| 500-3308 | 1.45 | .29 |
| 500-3314 | 1.90 | .38 |
| 500-3316 | 2.15 | .43 |
| 500-3318 | 2.40 | .48 |
| 500-3320 | 2.70 | .54 |
| 500-3624 | 3.25 | .65 |

| GENDER CHANGER | 1-9 | 10-49 |
|---|---|---|
| DB-25 MALE-MALE | 7.00 | 4.87 |
| DB-25 FEMALE-FEMALE | 7.00 | 4.87 |
| DB-25 MALE-FEMALE | 7.00 | 4.87 |



| | | |
|---|---|---|
| KEYBOARD EXTENSION CABLE 6 FT | 6.00 | 3.50 |
| KEYBOARD EXTENSION CABLE 12 FT | 12.00 | 5.00 |

INTERFACE FLAT CABLE ASSEMBLY

| | 1-9 | 10-49 |
|---|---|---|
| XT HARD DISK CABLE (2 PS) | 10.00 | 4.49 |
| AT DRIVE CABLE (3 PS) | 15.00 | 8.99 |
| 384K MALE-FEMALE FLAT CABLE | 15.00 | 8.46 |
| 384K FEMALE-FEMALE FLAT CABLE | 15.00 | 8.46 |
| RS-232 MALE-FEMALE FLAT CABLE | 10.00 | 4.26 |
| RS-232 FEMALE--FEMALE FLAT CABLE | 10.00 | 4.05 |
| DRIVE CABLE/3 PS 34 PIN CARD EDGE | 7.00 | 3.20 |
| DRIVE CABLE/2 PS 34 PIN CARD EDGE | 7.00 | 3.20 |

CABLE ASSEMBLY FOR IBM FULLY SHIELDED

| PRINTER CABLE (PC/XT/AT) | 1-9 | 10-49 |
|---|---|---|
| 800-2506-501 6 FT | 7.00 | 4.90 |
| 800-25300-121 10 FT | 10.00 | 7.71 |
| 800-2512-501 12 FT | 12.00 | 8.39 |
| 800-2524-501 24 FT | 24.00 | 13.50 |
| AMIGA CABLE | 1-9 | 10-49 |
| 801-2506-501 PRINTER CABLE 6 FT | 15.00 | 9.00 |
| 811-1006-501 RS-232 CABLE 6 FT | 15.00 | 9.00 |
| 852-0706-501 MONITOR CABLE 6 FT | 15.00 | 9.00 |
| 851-0806-501 RGB 6 FT | 15.00 | 9.00 |

| | | |
|---|---|---|
| RS-232 SERIEAL CABLE | 15.00 | 8.03 |
| MODEL 1000,1000SX,1000EX CABLE | 15.00 | 8.03 |
| MODEL 2000,6000 PRINTER CABLE | 15.00 | 8.03 |
| MODEL 3000,1200 PRINTER CABLE | 15.00 | 5.95 |
| MODEL 200,102,600 PRINTER CABLE | 15.00 | 7.03 |

| MODERM CABLE (PC/XT/AT) | 1-9 | 10-49 |
|---|---|---|
| 814-0906-501 DB25M-DB9F 6 FT | 9.00 | 6.42 |
| 814-0912-501 DB25M-DB9F 12 FT | 16.00 | 8.03 |
| 815-0906-501 DB25F-DB9F 6 FT | 9.00 | 6.42 |
| 815-0912-501 DB25F-DB9F 12 FT | 16.00 | 8.03 |
| 816-0906-501 DB25M-DB9M 6 FT | 9.00 | 6.42 |
| 816-0912-501 DB25M-DB9M 12 FT | 16.00 | 8.03 |
| 817-2506-501 DB25M-DB25M 6 FT | 12.00 | 8.25 |
| 818-2506-501 DB25F-DB25M 6 FT | 12.00 | 8.25 |

| RS-232 SERIAL CABLE(PC/XT/AT) | 1-9 | 10-49 |
|---|---|---|
| 811-2506-521 M-M 6 FT | 9.00 | 6.42 |
| 811-2512-521 M-M 12FT | 15.00 | 7.71 |
| 812-2506-521 M-F 6 FT | 9.00 | 6.42 |
| 812-2512-521 M-F 12 FT | 15.00 | 7.71 |
| 813-2506-521 F-F 6 FT | 9.00 | 6.42 |
| 813-2512-521 F-F 12 FT | 15.00 | 7.71 |

| CENTRONIC PARALLEL CABLE(PC/XT/AT) | 1-9 | 10-49 |
|---|---|---|
| 821-3606-711 M-M 6 FT | 12.00 | 7.71 |
| 822-3606-711 M-F 6 FT | 12.00 | 7.71 |
| 823-3606-711 F-F 6 FT | 12.00 | 7.71 |
| 821-3612-711 M-M 12 FT | 15.00 | 9.64 |
| 822-3612-711 M-F 12 FT | 15.00 | 9.64 |
| 823-3612-711 F-F 12 FT | 15.00 | 9.64 |
| 821-3624-711 M-M 24 FT | 24.00 | 15.00 |
| 822-3624-711 M-F 24 FT | 24.00 | 15.00 |
| 823-3624-711 F-F 24 FT | 24.00 | 15.00 |

| RGB MONITOR CABLE(PC/XT/AT) | 1-9 | 10-49 |
|---|---|---|
| 850-0806-501 6 FT | 9.50 | 6.42 |
| 850-0812-501 12 FT | 16.00 | 8.03 |

| MONITOR EXTENSION CABLE(PC/XT/AT) | 1-9 | 10-49 |
|---|---|---|
| 831-0906-501 6 FT DB9M-DB9M | 9.00 | 6.12 |
| 831-0912-501 12 FT DB9M-DB9M | 15.00 | 7.73 |
| 832-0906-501 DB9F-DB9M 6 FT | 9.00 | 6.12 |
| 832-0912-501 DB9F-DB9M 12 FT | 15.00 | 7.73 |

# Users Groups

University, Bronx, NY, 10456
**FOG AMO 135–New York Osborne Users' Group**, c/o William Cason, 484 West 43rd Street #14M, New York, NY, 10036, 212-594-5976
**215-Metropolitan Life Commodore UserSIG**, P.O. Box 1543 Murray Hill Station, New York, NY, 10156
**FOG AMO 82–Syracuse Osborne User's grouP**, c/o Gobind Singh Khalsa, 8371 Redwing Drive, Liverpool, NY, 13090, 315-622-9209
**FOG AMO 88–Long Island Osborne Network**, c/o Merit Machinery Corp., P.O. Box 190, Oceanside, NY, 11572, 516-781-2888
**300-Capital District Atari Comp. Enthu.**, P.O. Box 2216, Albany, NY, 12206
**218-Southern Tier Apple Core**, c/o Earle Naumann, Ely Park Apt. X-4, Binghamton, NY, 13905, 607-729-0708
**217-Sinclair Computer Users Society**, P.O. Box 36, Johnson City, NY, 13790
**219-TWIN Tiers Users Group**, c/o Rose J. Sass, Rock Stream, NY, 14878
**214-Integrity Computer Club**, 558 Breckenridge St., Buffalo, NY, 14222
**221-WW STUG**, 77 Kenton Place, Hamburg, NY, 14075
**FOG AMO 132–First Rochester Osborne Group**, c/o James T. McCollum, Attorney, 321 Executive Office Bldg, Rochester, NY, 14614, 716-232-7272
**216-Rochester Apple Cider**, P.O. Box 40562, Rochester, NY, 14604
**303-FHAUG**, c/o Joel Levin, 101-06 67th Drive, Forest Hills, NY, 11375
**212-Hudson Valley 99/4A Users Group**, c/o Brett Kropf, RD 1, Box 359-5, Kingston, NY, 12401, 914-336-6144
**213-Hudson Valley PC Club**, Box 6057, Kingston, NY, 12401
**FOG AMO 104–Westchester Osborne Group**, c/o Alfred Stamm, 33 Stratton Road, Scarsdale, NY, 10583, 914-725-1098
**220-Westchester PC User Group**, P.O. Box 54, Yorktown Heights, NY, 10598
**227-Cuyahoga Valley Atari Users Group**, c/o James Stewart, 2111 18th St. S.W., Akron, OH, 44314
**FOG AMO 75–Cleveland Osborne Group**, c/o Peter S. Tippett, 2135 Renrock, Cleveland Heights, OH, 44118, 216-888-2078
**228-FEDATA NET**, P.O. Box 11355, Cleveland, OH, 44111
**229-Northern Ohio Business Users Group**, 571 East 185th St., Euclid, OH, 44119, 216-944-5800
**290-The Northcoast 99ers**, P.O. Box 2283, Euclid, OH, 44123-0283, 216-357-7274
**FOG AMO 44–AKCAN Osborne Users Group**, c/o Jean Powell PA, 1525 Orrville Street NW, Massillon, OH, 44646, 216-837-8926
**FOG AMO 9--Oberlin Osborne /Ob/Os**, c/o Art Ribley, Box 5A, Oberlin, OH, 44074, 216-775-8706
**230-Penn Ohio 99/4A Home Computer U.G.**, 330 Crandall Avenue, Youngstown, OH, 44504
**FOG AMO 27–Cincinnati Osborne Group**, 6404 Coffey Street, Cincinnati, OH, 45230, 513-232-4076
**225-Greater Cincinnati IBMPC User Group**, c/o R. Reding, P.O. Box 3097, Cincinnati, OH, 45201
**226-CINTUG**, P.O. Box 399145, Cincinnati, OH, 45239
**FOG AMO 79--Dayton Osborne Group**, c/o ESKCO Inc., 2404 East River Road, Dayton, OH, 45439, U.S.A., 513-434-8207
**231-The Sandbox**, P.O. Box 541, Fairborn, OH, 45324-0541
**FOG AMO 67–OKlahoma CP/M Users' Group**, c/o William S. Cooter, 1809 Vanessa Drive, Norman, OK, 73071, 405-360-2141
**233-Tinker Atari Computer Enthusiasts**, P.O. Box 19956, Oklahoma City, OK, 73144
**FOG AMO 51–Osborne Users of Tulsa**, c/o James R. Roop, 1632 S. Denver, Tulsa, OK, 74119-4233, 918-587-3918
**232-Green Country Computer Association**, P.O. Box 497, Tulsa, OK, 74101, 918-245-6217
**FOG AMO 54–Rogue Valley Osborne Group**, c/o R. C. Gillette, 586 Glenwood Drive, Ashland, OR, 97520, 503-773-1222
**234-C-BUG**, 2001 NE Hyde St., Hillsboro, OR, 97124
**FOG AMO 57–Portland Micro Computer Society**, c/o Educational Research Associate, 333 SW park Avenue, Portland, OR, 97205-3784, 503-228-6345
**FOG AMO 128--Lane Osborne CP/M Users Group**, c/o The Hardware Head, 1404 Centennial Blvd., Springfield, OR, 97477, 503-747-8242
**238-Lehigh Valley Sanyo Users Group**, c/o John Orlando III, 1111 Mica Circle, Bethlehem, PA, 18017, 215-691-2794
**237-Decision Data Computer Users**, 100 Witmer Road, Horsham, PA, 19044
**FOG AMO 121–Philadelphia Region O Group**, P. O. Box 1144, Paoli, PA, 19301, 215-648-5862
**242-The York Area 99ers Users Group**, P.O. Box 7160, York, PA, 17404
**236-Atari Elite**, P.O. Box 58, Library, PA, 15129
**FOG AMO 50–Three Rivers Osborne Group**, P. O. Box 23152, 4th Ave. Station, Pittsburgh, PA, 15222, 412-661-2446
**235-Apple Army**, RD1 Box 83-1/2, Dornsife, PA, 17823
**FOG AMO 74–Lancaster Micro-Users Group**, c/o Allen H. Eshleman, 3624 Horizon Drive, Lancaster, PA, 17601, 717-285-4940
**FOG AMO 92--Mid-Pennsylvania Osborne Group**, P. O. Box 287, Lemoyne, PA, 17043, 717-763-7074
**241-S.A.G.E. of NE PA Atari Users Group**, 204 Sanderson Ave., Olyphant, PA, 18477
**240-Nittany Users of Texas Instruments**, 625 Wiltshire Drive, State College, PA, 16803
**239-NAAUG**, P.O. Box 376, Lemont, PA, 16851, 814-237-5511
**277-Commodore Users Group of PuertoRico**, Calle 16 35-24 Villa Carolina, Carolina, PR, 00630, 809-762-2422
**278-The VIC-20 Users Group**, c/o Roberto Morales, Jr., 655 Hernandez St., Miramar, PR, 00907
**FOG AMO 41–Piedmont Owners Group of Osborne**, c/o Bob R. Janes, 402 Roberta Drive, Greenville, SC, 29615, 803-233-3434
**247-North American Timex/Sinclair Group**, 4420 Alamaba Ave. #2, Chattanooga, TN, 37409-1614
**245-Music City Apple Core**, 2120 Crestmoor Suite 333, Nashville, TN, 37215
**246-Nashville Macintosh Users Group**, c/o Clark Thomas, 2305 Elliston Place #C5, Nashville, TN, 37203, 615-327-1757
**FOG AMO 13--Smoky Mountain Osborne Group**, P. O. Box 171, Oakridge, TN, 37831-0171, 615-483-6857
**FOG AMO 119–Middle Tennessee O Group**, c/o William Mittlesteadt, 1298 Hilltop Drive, Pulaski, TN, 38478, U.S.A., 615-244-5343
**243-East Tennessee Central Heath U.G.**, c/o G.R. Stradley, 1304 Witthollow Road, Sevierville, TN, 37862, 615-428-2057
**FOG AMO 15–Memphis Osborne Group**, c/o Isaac L. Kullman, 2753 Woodland Hills Cove, Memphis, TN, 38127, 901-358-8128
**244-Memphis Kaypro Users Group**, 5983 Macon Cove, Memphis, TN, 38103
**254-North Texas ST Users**, 625 Valley View, Allen, TX, 75002, 214-727-6567
**251-TRS-80 Users Group, Inc.**, P.O. Box 400472, Dallas, TX, 75240
**8-Dallas Osborne Group**, P. O. Box 531486, Grand Prairie, TX, 75051, 214-262-5816
**250-Dallas TI Home Computer Group**, 1221 Mosswood Place, Irving, TX, 75061
**FOG AMO 43--AGGi Non-profit Osborne Group**, c/o Gilbert L. Schroeter, 3521 Midwest Drive, Bryan, TX, 77802, 409-845-7770
**FOG AMO 7–A E I O U**, P. O. Box 1413, Austin, TX, 78767-1413, 512-836-3010
**248-Austin Atari Computer Enthusiasts**, 8207 Briarwood Lane, Austin, TX, 78758, 512-321-7640
**255-Randolph Area Atari User's Group**, P.O. Box 2611, Universal City, TX, 78148
**FOG AMO 76–Osborne Users Club, Houston**, c/o Bruce Wilson, 10510 Tradewinds, Houston, TX, 77086, 713-931-1096
**FOG AMO 108–Clear Lake Osborne & CP/M Group**, P. O. Box 57613, Webster, TX, 77598, 713-482-7877
**FOG AMO 28–Panhandle Osborne Group**, c/o Robert O. McNeil, 3028 N.E. 26th, Amarillo, TX, 79107, 806-355-7509
**FOG AMO 134–Lubbock Osborne Group**, c/o School of Law, Texas Tech University, Lubbock, TX, 79409, U.S.A., 806-742-3920
**123-Tarrant County Osborne Group**, c/o Marc McCauley, 3910 El Campo, Fort Worth, TX, 76107, 817-332-7027
**253-NET 99er HCUG**, P.O. Box 534, Hurst, TX, 76053
**249-Baylor Users Group**, c/o Gary Fleming, 1912 S. 5th #458, Waco, TX, 76706, 817-755-7603
**252-Lone Star Commodore Users Group**, 2120 Ramada Drive, Waco, TX, 76710
**FOG AMO 30–KAypro-OSborne users group**, c/o Jonathan L. Owens, 1093 W. 320 S., Orem, UT, 84058, 801-225-8293
**FOG AMO 105--Salt Lake Metropolitan O Group**, c/o James C. Miller, 1603 West Conifer Way, Taylorsville, UT, 84123, 801-268-2831
**107-NOrthern VirginA users group**, c/o Robert L. Crites, 7512 Fairwood Lane, Falls Church, VA, 22046, 703-560-5117
**257-Adventure Guild**, 313 William Street, Fredericksburg, VA, 22401
**259-Sanyo Users Group of Washington**, P.O. Box 2468, Fairfax, VA, 22031
**258-Richmond Tandy Users Group**, 13419 Oak Lane, Midlothian, VA, 13113
**FOG AMO 52–Central Virgina O G**, c/o Theodore B. Smith, 9206 Mapleway Road, Richmond, VA, 23229, 804-740-5714
**305-Greater Richmond Atari Support Prog**, c/o Kathi McCall, 3639 Luckylee Crescent, Richmond, VA, 23234
**FOG AMO 78–Tidewater Osborne Group**, P. O. Box 68068, Virginia Beach, VA, 23455, 804-497-5556
**FOG AMO 70–St. Croix Osborne Users Group**, c/o Photo-Ready Printing Inc., P. O. Box 2610 - Christiansted, St. Croix, VI, 00820, 809-778-6651
**256-Green Mountain Apple Club**, c/o Steve Hirsch, 985 North Avenue Apt. B7, Burlington, VT, 05401
**263-Starbase - An Official Atari U.G.**, c/o Wilma Crawford, 3223 177th Pl. NE, Arlington, WA, 98223
**266-Washington Amiga Group**, c/o Rich Medved, 7004 175th St. SW, Edmonds, WA, 98020, 206-743-9576
**FOG AMO 99–South King Osborne Group**, c/o Carl B. Tenning, 316 S. 193rd, Seattle, WA, 98148, 206-824-3843
**FOG AMO 112–Osborne Executive User's Group**, c/o Tim Mayhew, P. O. Box 12214, Seattle, WA, 98102, 206-232-2763
**260-Amiga User Group**, c/o Jim Naiden, 17050 2nd Avenue N.W., Seattle, WA, 98177, 206-546-3482
**261-K & K Sherman User Group**, 910 10th Avenue East Suite 204, Seattle, WA, 98102
**264-Telecommunications Users Group**, P.O. Box 45254, Seattle, WA, 98145-0254
**FOG AMO 72–Tacoma Osborne Group**, c/o Robert J. Thomson, 1808 Lenore Drive, Tacoma, WA, 98406, 206-752-5582
**262-Puget Sound Kaypro Users Group**, P.O. Box 88062, Tukwila, WA, 98188
**265-Vashon Island Sinclair-Timex Assoc.**, P.O. Box 199, Vashon Island, WA, 98070
**FOG AMO 123–Spokane Microcomputer Users Group**, c/o Rings & Things, P. O. Box 1753, Spokane, WA, 99210-1753, 509-482-7989
**FOG AMO 19–Three Rivers Osborne Group (WA)**, c/o Allen B. Webb, 743 North 61st Avenue, West Richland, WA, 99352, 509-967-2430
**272-Sinclair Milwaukee Users Group**, P.O. Box 101, Butler, WI, 53007
**FOG AMO 22–MILWaukee Osborne Group**, c/o Ken Biggers, West 170 North 11449 Armada Drive, Germantown, WI, 53022, 414-255-0440
**268-Appleton Atari Personal Computer UG**, c/o Greg Vanden Heuvel, 509 Willow Drive, Kaukauna, WI, 54130
**269-Atari Personal Computer Users Soc.**, c/o Karl Buss, 1230 South 20th St., Sheboygan, WI, 53081
**271-Packerland Atari Computer Users Soc**, c/o Peter Schefsky, 2714 South 11th Place, Sheboygan, WI, 53081
**270-Madison Area TI Users Group**, 3402 Portage, Madison, WI, 53704
**267-Mid-Ohio Valley Commodore Club, Inc**, P.O. Box 2222, Parkersburg, WV, 26102-2222
**FOG AMO 59–Kanawha Valley FOG**, c/o Harry Persinger, 486 Poplar Fork Drive, Scott Depot, WV, 25560, 304-727-8716
**273-Adamland International Adam U.G.**, 795 Garfield, Lander, WY, 82520
**FOG AMO 94–Calgary Osborne Users Group**, c/o W. Greg King, 24 Edgedale Way NW, Calgary, ALTA, T3A 2P8, CANADA, 403-239-5685
**FOG AMO 17–Vancouver Portable Computer Club**, P. O. Box 80621, Burnby, B.C., V5H 3Y1, CANADA, 604-298-6990
**274-Okanagan QL Users Group**, c/o W.M. Johnston, Site 41 e. 17 RR#3, Penticton, B.C., V2A 7KA, CANADA
**24-Muddy Waters Osborne Group**, Box 155A R. R. #5, Winnipeg, MAN., R2C 2Z2, CANADA, 204-224-3513
**FOG AMO 45–Klondike Osborne Group**, c/o Compass, 20 Marion Drive, Sherwood Park, Alta, T8A 0M1, CANADA, 403-464-5088
**FOG AMO 120–Osborne Users Club of Toronto**, c/o Walter Weary, 105 Galley Avenue, Toronto, Ont., M6R 1H2, CANADA, 416-533-1531
**FOG AMO 95--London Osborne Group**, c/o Jack Lorimer, 1625 Hillside Drive, London, ONT., N6G 2R1, CANADA, 519-434-1944
**FOG AMO 73–Montreal O & CP/M Users Group**, c/o Gerald P. Barry, 3463 Ste Famille Apt. 1010, Montreal, P.Q., H2X 2K7, CANADA, 514-932-4164
**FOG AMO 131–Victorian Osborne Users Group**, c/o Charles Sandercock, 7 Illawarra Road Hawthorn, Victoria, 3122, AUSTRALIA, 03-818-5062
**66-Osborne U G of Western Australia**, P. O. Box 199, Mundaring, W.A., 6073, AUSTRALIA, 09-295-1449
**FOG AMO 126–FORMICRO**, c/o Ulrik Jantzen, Teglgaardsvei 6, Charlottenlund, DK-2920, DENMARK, 45-163-1760
**74-British Osborne Owners Group**, c/o Priory Cottage, Ard Chappan Priory, Bonawe Oban Argylles, PA371RQ, ENGLAND, 0-63-17-52-96
**FOG AMO 110--Osborne Users FRANCE**, c/o William A. Graham, 10 rue Saint Nicolas, Paris, 75012, FRANCE, 43-44-82-65
**222-Zweibrucken Commodore Computer Club**, Box 235 200th TAMMC, APO, NY, 09052, GERMANY
**298-Aaron Commodore User Group**, c/o Justin L. Blocker, HHD AFCENT SUPACT (US) Box 2881, APO, NY, 09011, GERMANY
**301-Commodore User Club**, P.O. Box 2499, APO, NY, 09130, GERMANY
**302-Computers Anonymous**, c/o Ric Rubio, PSC Box 1499, APO, NY, 09289-5364, GERMANY
**FOG AMO 33–Israel Osborne Users Group**, c/o Eliahu Zuck, 8 Lakhish Str., Tel Aviv, 64164, ISRAEL, 0-523-4043
**276-Microcomputer Club**, c/o Alfredo Bozali, Fte. De Quijote #5, Mexico 10 D.F., MEXICO
**FOG AMO 53–New Zealand Osborne Group**, c/-P. O. Box 43-182, Mangere, AUCK, NEW ZEALAND, 09 275-4310
**FOG AMO 109--Central Region Osborne Group**, P. O. Box 6571, Te Aro, Wellington, NEW ZEALAND, 640-479-1172
**275-Panama Canal Atari Users Group**, Apartado No. 5265, Balboa-Ancon, PANAMA
**279-European Appleshare**, c/o CNOGB, Chris Stone, Torre De Madrid Planta 7 Oficina14, C/PRINCESA 1, Madrid, 28008, SPAIN
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**FOG AMO 85–Microcomp. In Sup. Of Trans.**, c/o Wycliffe Bible Translators, P.O. Box 188, Eastlake, CO, 80614, 303-450-9608
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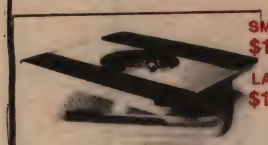

SMALL 12" $11.95

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## IBM COMPATIBLE BARE PC BOARDS

All these bare PCB come with a parts list, placement diagram showing where they go. We do not have circuit diagrams unless indicated. The EPROMS and PROMS are for sale as is certain non-infringing software for use with the boards.

**HEXPACK** A workalike copy of the famous AST SIX-PACK, WITH UP TO 384K RAM, Clock, Calendar and Serial and Parallel ports. 100% IBM and AST compatible, complete with schematic, parts placement and assembly data.....$24.95
Optional complete manual and software diskette....

**MONTE CARLO** One of the best multifunction cards we have ever seen. This one takes either 64K or 256K RAMS in any combination for up to 1 Mbyte on board. (640K DOS accessble, balance subroutine accessed) PLUS two game ports, Clock, Calendar and Serial and Parallel ports. Clearly an awe inspiring array of functionality on a single card. Complete with schematic, parts list and placement diagram.....$34.95
Optional complete manual and diskette.....

**COLOR GRAPHICS** A workalike copy of the popular PERSYST color graphics card. 100% true to original and 100% compatible to IBM std. With assembly data.....$24.95

**384K** RAM only in close array, 384K of 64K RAM ideal for economy enhancement of system capacity. With all assembly data.....$16.95

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**KRAM CARD** We took a 512K card and rewired it for 256K RAMS. It now has four times the memory or 2 MBYTES. It closely follows the function of the popular JRAM card as all this type do, and also shares partition ing parameters to the extent that it will run the JRAM software or other similar programs. RAM Disc Drives are very easy to delineate. With all assembly data.....$34.95

**PROTOTYPE** 100% WW holes with DB-25 and DB-9 footprint on end.....$24.95

**PROTOTYPE+RAM** This unique card has a memory array at one end. 36 16 pin sockets are placed in copper on board with all bussing in common, but with CAS, RAS etc brought out row by row and column by column so that either 64K or 256K RAMS can be quickly wired in. A 0.1 bypass cap is on each IC as well. The remaining ¾ of the board is 100% WW holes with a DB-25 and DB-9 footprint on one end.....$24.95

**EXTENDER** When you need to service a card with power on it is very hard to get at the board to trace signals etc so we made this little gem that lifts the whole thing up by about 6" for easy access.....$19.95

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FOR ANY SLOT

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As you know NEC has been hard at work making a work-a-like copy of the 8087 math co-processor chip. Rumor has it that it will have enhanced capabilities over the 8087 in the same way the V-20 is enhanced over the 8088. We are getting some in in June and can sell them for only $119.00 each for the 5 Mhz version. Further data available in June as well as data sheets. Orders are on a first come first served basis. NO COD's

NEC 8087.....$119.00

## PANASONIC JU455-5

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The new PANASONIC JU455-5, with surface mount technology for near infinite solid state lifetime. SHUGART had all it's drives made by Panasonic after it closed it's US factory so you know they are very good.

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A board that we have fully stuffed and wave soldered so you just add the IC's and go. You save all the solder time. Buy one now!!!!.

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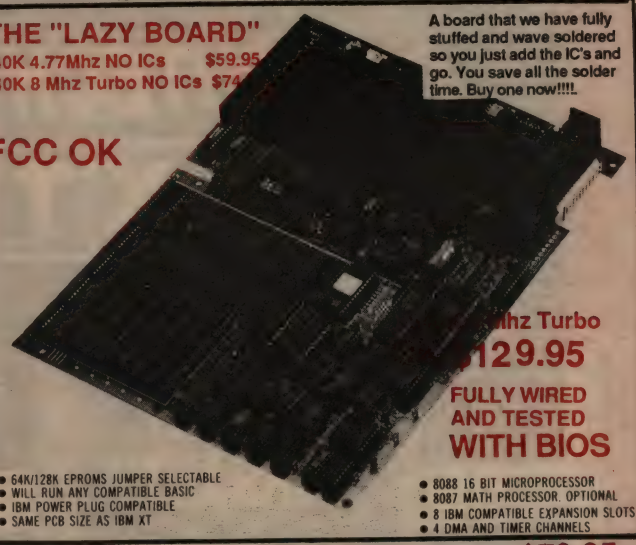

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- 8 IBM COMPATIBLE EXPANSION SLOTS
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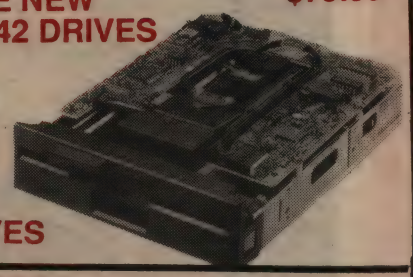

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- ½ Height • 48 TPI
- New Quiet Operation
- IBM Compatible
- New Front Panel Design

REAL IBM DRIVES

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What is the most annoying thing you can have happen while you are using your XT, MAC or other computer?? You guessed it, a power failure or sharp line transient that causes total loss ofcurrent work-file data in RAM, and that can also cause hard drive head crash, ruining the data or even ruining the drive. A UPS is the answer to this problem. The letters stand for Uninterruptible Power Supply, and refer to a power supply with a built in Battery that constantly monitors the AC line and when it sees a drop in the 120 volt line it starts to run the computer from the battery, synthesizing the 120V 60 cycle sine wave and running your whole system for you. This allows you to quickly back-up your files, and shut down your system in the proper sequence. You can even keep going as if nothing had happened and as long as the line power came back within a reasonable time you would not have any loss at all of operating time or data.

PORTABLE 120V SOURCE FOR CAR/BOAT USE

Just run from the 12VDC vehicle plug and you can have 150 Watts of 110V AC for running any item(250W intermittent)

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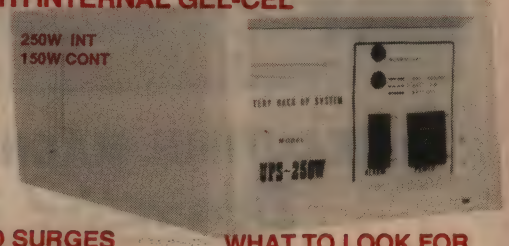
250W INT
150W CONT



NO SURGES
NO BROWN OUT
CUTS OUT LINE NOISE

$289.95

WHAT TO LOOK FOR

| | |
|---|---|
| 1. High efficiency | 85% |
| 2. Sinewave(avoid modified square wave) | Sinewave |
| 3. Internal no-spill battery | Yes |
| 4. External battery terminals | Yes |
| 5. Audible power loss warning | Yes |
| 6. Fast transfer time, under 5 Ms | Yes |
| 7. Multiple output sockets | 2 |
| 8. % of line transients filtered | 100% |

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Yes an automatic discount for anyone who wants to buy in small volumes. Wholesale discounts can be arranged, please call with your needs.

## SWITCH BOX

These switch boxes are high quality, with fully switched wiring, not the cheap type that only switches the enable line. They come in both serial and parallel styles with a fan out of 2 or 4. The push button selector allows for easy one hand use.

SER/2 $39.95 PAR/2 $39.95

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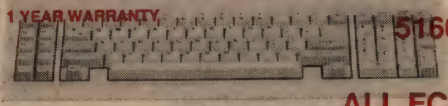
## IBM COMPATIBLE KEYBOARD

1 YEAR WARRANTY



5160

ALL FCC OK

The keyboard is one of the two parts of any system that are full of moving parts, and are heir to mechanical failure. So you should take care before you pay your $$$ for what may be a piece of junk. What does it matter if you save $10.00 and get 1000 hours of aggravation over the next few months(if it works that long) with rubbery switches, funny clicking noises, painted plastic that rubs off, and so on. Here at Parts Galore we buy with care, so that we do not sell any junk, because we do give a warranty, and we have been in the mail order business for 7 years. Can all the newcomers in mail order say that?? Can you trust them??

**5150** The Std XT type, with large Return key, all features built in micro.....$54.95

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## CABLES CABLES

8 FEET,10 FEET, 20 FEET

**PARALLEL**, Std IBM printer cable, 25-36 pin, double shielded.8'..$8.95,10'..$9.95

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**EXTENDER**, 36 pin male to female Centronics for fan out boxes or extensions etc. 8'....$10.95, 10'....$12.95, 20'....$19.95

At last the ATTAK-286 board is in stock!, It was worth the wait as it is a very good board using the LSI chip set from CHIPS TECHNOLOGY that you have read about. The board is the same size as the real AT and has 4 layers for noise free operation. It has all the features of the AT, and some more of it's own, like 1MB on board,8,10,12 Mhz operation, PHOENIX BIOS, and it runs like a deer.
We got our pictures too late to make this press run of the SHOPPER but if you call up we can send you a set of descriptive literature that will tell more than we could put in this ad.
We are offering the board in several formats to suit almost all buyers. All boards have been pretested for shorts and opens on a bed of nails.

(A) Fully wired and tested,zero RAM, with all IC's, ...$495.00
(B) Socketed board, pretested, but no IC's at all,.. .$199.00
(C) Bare pretested PCB with parts list.....$99.00
(D) Detailed technical manual with full C & T data and full schematics, with users hints.....$29.95
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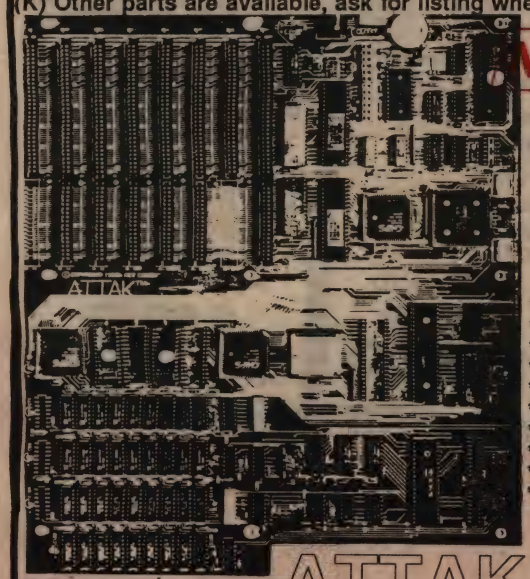
(H) HINGED TOP AT CASE, Easy access .....$129.95
(I) AT Keyboard, see AT/XT keyboards
(J) CHIPS & TECH 5 Chip set.....$99.00
(K) Other parts are available, ask for listing when you order.



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* 8 INTERFACE CONNECTORS
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* CMOS CLOCK CALENDAR
* 80287 MAT CHIP OPTIONAL
* RUNS 8,10,12 MHZ
* ON BOARD BATTERY
* STD AT BOARD SIZE
* AT PERIPHERAL CIRCUITS

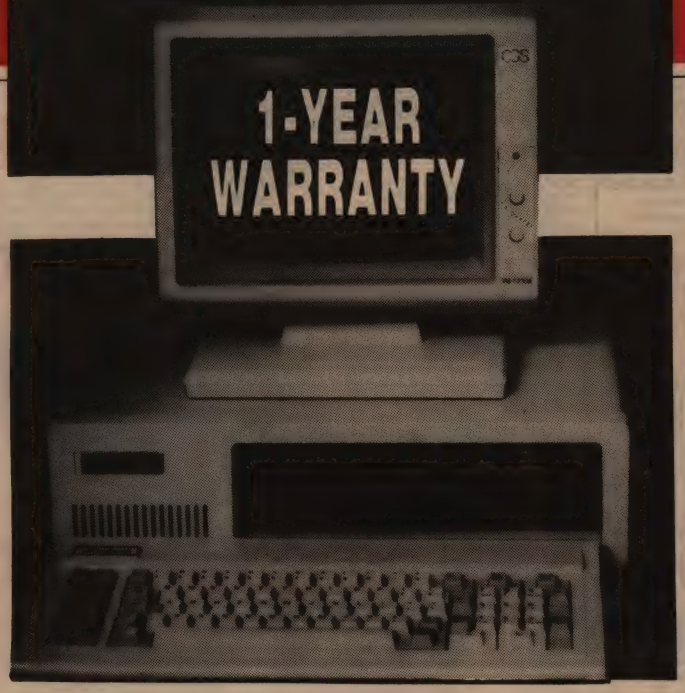
## AT FLIP TOP CASE

Board Size: Standard IBM-AT*
Dimensions: 12 inch × 13.8 inch with 6 mounting holes to fit all AT compatible cases.

## CHIPS & TECHNOLOGY ATTAK-286 CHIP SET

MODEL 1. FOR 8,10,12 MHZ OPERATION

# COMPUTECH TURBO XT

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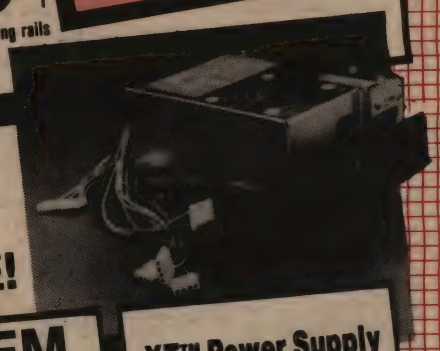

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Gives you that extra edge.
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# Coming Events

**If you know of or have a trade show, swap meet or club meeting connected with the computer field, we'll run an announcement in the COMING EVENTS section FREE of charge.**

**October 30-November 1, 1986**
The ninth SOUTH FLORIDA COMPUTER & BUSINESS EQUIPMENT SHOWCASE, an expositon of small computer and business equipment users will be presented at the Miami Expo Center. Geared to business, professional and corporate users of computer systems and business equipment. For additional information contact The Interface Group, 300 First Avenue, Needham, MA 02194; (617) 449-6600.

## NOVEMBER

**November 1, 1986**
The IBM & Clone Expo will be held at the Meadowlands Hilton Hotel, on Route 3, 4 minutes west of New York City. Over 175 vendors will sell and display personal computer products of all kinds for IBM compatible computers inlcuding hardware, software, books, supplies, accessories and parts. Show hours are 10am to 4pm. For additional information call (800) 631-0062 or in New Jersey call (201) 297-2526.

**November 1, 1986**
The BAY-AREA COMPUTER SWAP is a one-day personal computer swap meet where thousands of new and used products will be available for immediate purchase by show attendees.

Retailers, manufacturers, distributors and individuals will offer outstanding savings on a wide variety of hardware and software products for business, education, entertainment, hobby and home use. Accessories, supplies, peripherals and complete personal computer systems representing hundreds of brand names will be available to shoppers at discount prices.

The Swap will be held at the Santa Clara County Fairgrounds located at 344 Tully Road in San Jose, California. The show will be open to the public from 10:00am to 5:00pm. Admission is $5.00. Children under 12 are free.

For additional information contact MICROSHOWS, 1209 Donnelly Avenue, Suite 203, Burlingame, CA 94010; (415) 340-9113.

**November 2, 1986**
The MICRO COMPUTER FAIR will be held at the Oak Lawn Masonic Lodge, 9420 S. 52nd Avenue, Oak Lawn, Illinois. Personal, business, hobby, hardware, software, supplies, accessories. Admission $3 per person. For additional information contact Tom Zarecki (312) 839-2611.

**November 6, 1986**
The COMPUTER TRADING POST will be held at the Glendale Civic Auditorium, 1401 North Verdugo Road, Glendale, California. Indoor computer trade show and swap meet. 100 vendors, new and used, hardware, software, books, services, user groups, seminars, workshops, free parking, entertainment. $3.00 admission.

For additional information call (818) 352-9829; or write 511 W. Glenoaks Blvd., #228, Glendale, CA 91202

**November 8, 1986**
The 4th Maryland/DC/VA Micro Show will be held at the Sheraton Hotel Convention Center, Exit #20-B of I-95, in New Carrollton, Maryland, just a few minutes north of Washington and 30 minutes south of Baltimore. Over 250 vendors will sell and display personal computer products of all kinds for IBM, Apple, Commodore, Atari, etc. Show hours are 10am to 4pm. For additional information call (800) 631-0062 or in New Jersey call (201) 297-2526.

**November 10-14, 1986**
The eighth annual COMDEX/Fall, the world's largest computer industry trade show will be held at seven major Las Vegas facilities—Las Vegas Convention Center, the Convention Center's West Hall, the Las Vegas Hilton, Riviera, Sahara, Caesar's Palace, and MGM Grand hotels. For additional information contact The Interface Group, Inc., 300 First Avenue, Needham, MA 02194; (617) 449-6600.


TRI STATE COMPUTER FAIRS

Sunday, Nov 16 — Holiday Inn- Cherry Hill NJ
10AM — 4PM — rt 70 & Sayre Av 85 tables

Sunday, Nov 30 — Meadowlands Hilton- near
10AM — 4PM — rt 3, Secaucus NJ 150 tables

Sunday, Dec 28 — Holiday Inn- Suffern NY
10AM — 4PM — NY thruway ex 14b 100 tables

dealer tables $35 adm. $3.50 w ad 1 or 2 at $3
for more info please call ROBERT BARLOW
(201) 533-1991
POST OFFICE BOX 76
LIVINGSTON, N. J. 07039


**November 20-22, 1986**
The sixth LOS ANGLES COMPUTER & BUSINESS EQUIPMENT SHOWCASE, an exposition for small computer and business equipment users, will be presented at the Los Angeles Convention Center. Geared to business, professional and corporate users of computer systems and business equipment. For additional information contact The Interface Group, Inc., 300 First Avenue, Neeham, MA 02194; (617) 449-6600.

**November 20-22, 1986**
The sixth CHICAGO COMPUTER & BUSINESS EQUIPMENT SHOWCASE, an exposition for small computer and business equipment users, will be presented at McCormick Place, Geared to business, professional and corporate users of computer systems and business equipment. For additional information contact The Interface Group, 300 First Avenue, Needham, MA 02194; (617) 449-6600.

**November 23, 1986**
COMPUTER CENTRAL, the multivendor personal computer show for everyone! New and used hardware, software, peripherals, supplies, parts, etc. This show will be held at Holiday Inn, 860 Irving Park Road, Itasca, Illinois. The show hours are from 9:30am to 4:00pm. Admission is $4. For additional information call (312) 940-7547.

**November 23, 1986**
The 2nd Long Island Micro Show will be held at the Colonie Hill, Exit #57 of the Long Island Expressway, in Hauppauge, NY. Over 300 vendors will sell and display personal computer products of all kinds. Show hours are 10 AM to 4 PM. There is free parking for over 1500 cars. For additional information call 800-631-0062 or in New Jersey call 201-297-2526. Sponsor of the show is Ken Gordon Productions.

**November 29, 1986**
The 5th South Jersey Micro Show will be held at the Betsy Ross Plaza (formerly the Halloran Plaza) on Route 130 in Pennsauken, New Jersey, just one minute from Center City Philadelphia. Over 275 vendors will and display personal computer products of all kinds. Show hours are 10 AM to 4 PM. For additional information call 800-631-0062 or in New Jersey call 201-297-2526. Sponsor of the show is Ken Gordon Productions.

## DECEMBER

**December 3-5, 1986**
The second annual INTERFACE in JAPAN Conference and Exposition will be held at the World Import Mart and Sunshine City Prince Hotel in Tokyo, Japan. Leading Asian companies are expected to display and demonstrate computer systems. This show will also feature a conference of more than 25 sessions led by international experts, on a variety of technical and management-oriented subjects related to data communications and office systems integration.

For additional information contact The Interface Group, Inc., 300 First Avenue, Needham, MA 02194; (617) 449-6600.

**December 6, 1986**
The second annual RENO COMPUTER FAIRE is scheduled for December 6th. It will be housed in 7,000 square feet of space and have local and national major vendors in attendance.

For additional information contact Mike Katz at (702) 852-BYTE.

**December 6, 1986**
The BAY AREA COMPUTER SWAP will be held at the Cow Palace, San Francisco, California. Ths is a one-day personal computer swap meet where thousands of new and used products will be available for immediate purchase by show attendees.

Retailers, manufacturers, distributors and individuals will offer outstanding savings on a wide variety of hardware and software products for business, education, entertainment, hobby and home use. Accessories, supplies, peripherals and complete personal computer systems representing hundreds of brand names will be available to shoppers and discount prices.

For additional information contact MICROSHOWS 1209 Donnelly Avenue, Suite 203, Burlingame, CA 94010; (415) 340-9113.

**December 7, 1986**
The 5th South Jersey Micro Show will be held at the Aspen Manor/Hotel on Route 46 in Parsippany, NJ, near Interstates 80, 280 and 287. Over 400 vendors will sell and display personal computer products of all kinds. Show hours are 9 AM to 4 PM. For additional information call 800-631-0062 or in New Jersey call 201-297-2526. Sponsor of the show is Ken Gordon Productions.

**December 7, 1986**
The MICRO COMPUTER FAIR will be held at the Oak Brook Hyatt, 1909 Spring Road, Oak Lawn, Illinois. Personal, business, hobby, hardware, software, supplies, accessories. Admission $3 per person. For additional information contact Tom Zarecki (312) 839-2611.

**December 11-13, 1986**
The second annual INTERFACE in Japan Conference and Exposition will be held at the Harumi Exhibition Center and Keio Plaza Hotel in Tokyo. More than 150 companies are expected to display and demonstrate computer systems and communications services for large-scale corporate, government and institutional systems users in Japan, Korea, Taiwan (R.O.C.), Singapore, Hong Kong, and the People's Republic of China. For additional information contact The Interface Group, 300 First Avenue, Needham, MA 02194; (617) 449-6600.

**December 14, 1986**
The 120th Boston Area Micro Show will be held at the Sheraton Exhibit Center, I-495 and Route 111, in Boxboro, Mass. (New location - other shows held in Woburn, Mass.) Over 200 vendors will and display personal computer products of all kinds. Show hours are 10 AM to 4 PM. For additional information call 800-631-0062 or in New Jersey call 201-297-2526. Sponsor of the show is Ken Gordon Productions.

## JANUARY 1987

**January 4, 1987**
The ROCKLAND COUNTY COMPUTER FAIR returns to the Holiday Inn, Suffern, New York, located at exit 14B of the N.Y. Thurway. The hotel is just 30 minutes from NYC and is 5 miles from the intersection of the Garden State Parkway with the Thruway. Open to the public from 10am to 4pm.
For additional information call (201) 533-1991.

**January 23-24, 1986**
The second annual USER GROUP AND COMPUTER SHOW will be held at the West Manchester Mall, 1800 Loucks Road, York, PA 17404. Area user groups and local computer vendors will be present to help the computer user and hobbyist. Advance registration required by user groups and vendors. Free admission to the public.

For additional information contact Ms. Barbara Sipling, Marketing Director, (717) 764-5941.

## FEBRUARY 1987

**February 1, 1987**
The COMPUTER/CAMERA/VIDEO SWAP MEET will be held at the Century Center, downtown South Bend, Indiana from 10am-4pm; exhibitor set-up 8am.

For additional information contact Roger L. Smith, P.O. Box 6486, South Bend, IN 46544; (219) 259-2968 before 9:30pm EST.

**February 7-8, 1986**
The 27th TROPICAL HAMBOREE sponsored by Dade Radio Club will be held at the Dade County Youth Fairgrounds at Tamiami Park. This well established event will have two full days of activities including 200 commercial exhibit booths, 1,000 tables of pre-owned equipment, and numerous technical presentations on subjects such as packet radio and satellite communications, plus valuable awards. Hours are 9:00am to 5:00pm Saturday and 9:00am to 4:00pm sunday.

For additional information contact Evelyn Gauzens, 2780 N.W. 3 Street, Miami, FL 33125; (305) 642-4139.

## MAY 1986

**May 3, 1987**
The COMPUTER/CAMERA/VIDEO SWAP MEET will be held at the Century Center, downtown South Bend, Indiana from 10am-4pm; exhibitor set-up 8am.

For additional information contact Roger L. Smith, P.O. Box 6486, South Bend, IN 46544; (219) 259-2968 before 9:30pm EST.

## SEPTEMBER 1987

**September 13, 1987**
The COMPUTER/CAMERA/VIDEO SWAP MEET will be held at the Century Center, downtown South Bend, Indiana from 10am-4pm; exhibitor set-up 8am.

For additional information contact Roger L. Smith, P.O. Box 6486, South Bend, IN 46544; (219) 259-2968 before 9:30pm EST.

**Tales of Horror continued from page 52**

more like ten calls) gets him a connecting cable here and a modem hook-up there. Now and then, Tom takes the plunge and buys supplementary equipment such as a new printer. The Band-Aid method seems to work and Tom sees no point in blowing his budget on all-new equipment.

The problem is that the patches between disparate elements in Tom's system tie up the phone lines and cost time and effort. He turns to a troubleshooter and together they work up a series of even more patches to the system—and even some patches to the patches. But eventually Tom realizes that much of the time saved by this Rube Goldberg troubleshooting is swallowed by the time he's spending just to make the system work. He's up to his knobby knees in disks and cables now, wondering if the old blizzards of paper weren't so bad after all. He's also becoming concerned that if one more thing goes wrong, the whole electronic edifice might come crashing down in a display of sparks and disk-destroying magnetic fields, bringing his business along with it.

*Moral*: Once a system is running, people run the risk of becoming subservient to it. When things go wrong, you spend a little money and stick on a Band-Aid, and then more money and more Band-Aids. Soon you find you can't see the forest for the bandages, and that fixing things has become more involved (and sometimes more expensive) than if you'd swallowed the big picture at the outset and undertaken an overhaul.

***Avoiding Tom's Fate***: A computer system is much like a business in that there's a point at which growth requires reorganization and an influx of capital. It is key, when approaching that stage, to stand back and assess the whole picture. Establishing connections among a large number of computers can become labyrinthine, and hence, strained. The alternative is a local area network—a smart next step to take above serial communication. Local area networks (LANs) can seem extraordinarily expensive when you're making the initial outlay—but they can prove cheaper and more efficient in the long run. A LAN connects your computers through a special communications line dedicated to that very purpose. Once they're linked, they form a network, sharing files as though part of one big computer. They can also share peripheral equipment, such as a central hard disk or laser printer. As a result, you can review the data of the entire operation on your own screen at any time. Their is on caveat, however: security. Since all information can become available to every terminal on a LAN, make sure to set up a password system so only those authorized to access certain information can in fact get to that information.

**Why Can't Things be Simpler?**

"Will there ever come a day," you wonder, "when one electronic device can simply be plugged into another—when a standard socket will enable them to communicate regardless of who's made the software or hardware?"

The answer is yes. In the computer music industry that's already a reality—the MIDI standard links synthesizers of all makes and capabilities. In the office milieu IBM is rapidly becoming a defacto standard for microcomputers. And another beacon of hope has appeared recently. Over 50 of the industry's giants—including AT&T, IBM, Digital Equipment Corporation, Wang and Xerox—have begun to forge a truce. Called the Corporation for Open Systems, they've set themselves the lofty goal of hastening the development of standard computer and communications equipment.

However until that time of miracles, when goals are met and standards are set, you will have to keep on your toes and learn the lingo. Mere automation is not enough. You're going to have to put on a happy interface. ●


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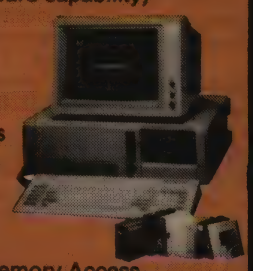

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**USED SHUGART SA612 FULL HIGH 10 MEG TESTED — $75**

**CONNECTOR SPECIALS**
**DB HOODS**
**PART# PRICE**

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|---|---|
| 9H | $.75 |
| 15H | $.80 |
| 25H | $.80 |
| 37H | $1.00 |

**TI SURPLUS**
TI 990 main chassis-power supply w/card cage. Stk. #990-main $99
TI Silent 700 terminal w/keybd & modem. Stk. #TI-700 .....$39.95

**NEW COMMODORE SURPLUS BARGAINS**
C116 Wall Plug Adapter 9.5V @ 1 Amp
Stk #TN-116
$3.95 Each or 10/$2.50

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Stk. #KYB-64 .....$14.95

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2.25" 8 ohm, 25 watts. This is the same speaker that IBM uses. Excellent for computer builders. Stk. #SPK-8 .....$.65

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Input: 120 VAC Output: 12VAC CT @ 1.7 AMP UL Approved
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Complete with all electronics. Requires 12 VDC @ 1.5 AMPS
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Stk. #T-500 500 PC 2N2222—$3.50

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**COMPUTER CHESS GAME**
NEW
**MILTON BRADLEY CHESS GAME**
Electronic circuit board removed from famous toy maker's game. Board has 6502 processor. 74LS series IC's, buzzer & many other useful components. Boards are complete and un-damaged. MB part #7924243001.
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**4" COOLING FAN 120 VAC — NEW**
Stk.# FN-4—$6.50

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2" Bar Magnet with tape on one side .....2/$1

**POWER SUPPLY 5V@35 AMP $45.00**

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TN-24A 117 24 @ 200ma .....$.125
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Mfg. by Signal Trans
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24 Guage standard cond.
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For Standard 8½x11

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**V-20 SPEED-UP**
5MHZ—$10.95
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**DEFECTIVE IBM COMPATIBLE COMPONENTS**

| | |
|---|---|
| Disk Drives — DSD, need alignment | $40 |
| Keyboards | $25 |
| Power Supplies | $20 |
| Floppy Contr | $15 |
| TTL monitors | $40 |
| Motherboards | $65 |

**DAVONG HARD DISK CONTROLLER, FOR IBM COMPATIBLE SYS ...$49.95**

**8" SHUGART SA801**
$65.00
—FULL HEIGHT
—SINGLE SIDED
—600 KB FORMATTED

**8" SHUGART SA850 DSDD—$70.00**

**SHUGART SA 1004 10 MEG HARD DRIVE**
8" DRIVE, NEW $125.00
DTC Controller for above drive .....$65.00

**ATARI GAME ROMS**
An assortment of 10 Atari game ROMs. Simply open any Atari cartridge & replace the existing ROM with a new one. Play another 10 games instantly. Stk. #ROM-10 10/$2.50

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We received a large shipment of these cable converters. Good savings!

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1-214-458-1886

**LOLIR—FARMERS BRANCH, TX**
3216 Beltline #606
Farmers Branch, TX 75234
1-214-241-2145

**LOLIR—SAN ANTONIO, TX**
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# IBM COMPATABLE COMPUTERS & COMPONENTS

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## MISC. IBM COMPAT PROD.

Parallel A-B Switchbox.....$39
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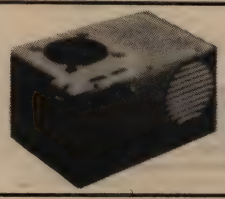
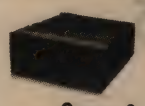
Step One Accounting .....$69
Tandom Quad Density ½ high SS-4 $79

## POWER SUPPLIES



135 Watt ...$65
150 Watt ...$75
200 Watt/AT$125

## EXTERNAL DRIVE



Case & Power Supply-85 watt holds 2 HH or full high case-Ext .....$105

## 3RD GENERATION TURBO SYSTEM

- 20 Meg Drive
- Super 4-layer MBD running @8MHZ
- Single DSDD Drive
- 640K Memory
- Fast BIOS
- Ser., Paralle., Game, clk-cal.
- Monochrome card & high res. monitor
- Bundled programs
- DOS 3.1

**$1225**

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**Adaptec** 2070A RLL hard disk contr. .....$185

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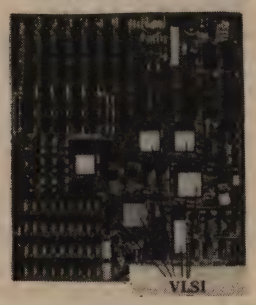
Attack 286 Motherboard 20 MEG hard Drive1.2 MEG Floppy Drive Monochrome Graphics Card Hi-Res Monochrome Monitor Serial—Parallel ports Real Time Clock Calendar DOS 3.1 & Bundled Software

**$1795**

## AT-COMPATABLE MOTHERBOARD ATTACK—286




- 80286 Running @ 8 MHz
- 80287 Socket
- VLSI Technology
- 1 Meg Memory on Board
- Phoenix ROM BIOS
- On Board Battery

**$499.95 w/OK**

## NEW AT-SETUP SAVER

External Power Supply Plugs into Battery Connector on Motherboard. Never Worry about losing Set-Up Again!
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## SUPER EXTERNAL EPROM PROGRAMMER

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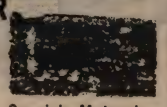

- 2716-27256 & Special Motorola MCM68764 & all "A" series EPROMS
- Connects thru parallel port
- Fast algorithm software

*** NOTE! IT IS ILLEGAL TO USE THIS DEVICE TO COPY REAL IBM ROMS**

## MONITORS

Samsung Composite .....$64
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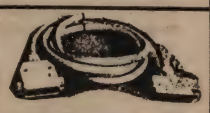
Magnavox TTL .....$89
Magnavox Color 80 RGB 640X200 .$285
Packard Bell w/tilt swivel .....$105
Tatung EGA 640X350 .....$445

## CABLES FOR IBM SYSTEMS



CAB-800 IBM Printer cable (Centronics) ..$10
CAB-825 Serial cable, 6', DB25 male to male $10
CAB-835 Serial cable, 6', DB25 male to fem $10
CAB-600 RGB Ext. cable, 6', DB9 male to fem$10
CAB-500 6' keyboard ext. cable .....$5
CAB-550 6' composite video cable .....$2
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**FOR YOUR XT MOTHERBOARD**

**$69**

NEW

- Same Dimensions as XT case
- LED Indicators & key lock
- Complete mounting hardware

**Stk. #CASE-75**

## CLONE TECH MANUALS

Clone builders manuals. Did you buy an IBM clone & didn't get any kind of operation manual? We put together some manuals on how to hook everything up, how it works & basic trouble-shooting techniques. Complete with schematics.

**XT-Manual** .....$19.95
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## CLONE XT SCHEMATICS

with Waveforms for easy servicing
SCH-XT .....$9.95

**NEW ROM SETS FOR XT's & AT's**

**IMPROVED SPEED**

Speed-up Bios for standard motherboard. If your system takes a long time to run format or diskcopy", this ROM's for you.
**Stk# BROM-35**.....$14.95

**NETWORKING BIOS ROM**

New ROM lets you run the Novell Network as well as others. Will work in Turbo boards but will not support the Turbo mode.
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A new 2 chip BIOS set that replaces the BIOS on your XT or Turbo XT motherboard. These eliminate many of the system & parity errors that occur. Also eliminates "lock-up" problems in some Turbo XT boards. IBM compatible.
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**TURBO XT SUPER ROM**

If you think your Turbo board is fast — put this new BIOS ROM in it & hold your socks! This is the fastest ROM we've seen for a Turbo bd. yet.
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CAB-525 Cable for Above .....$15
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VID-450 Monochrome Graphics w/Serial, Par, Game .....$145
MFC-110 Ser-Parallel Card .....$72
MFC-3004 3 Meg Intell Memory Card Clone with 0 memory .....$225
PS-200 200w, Power Supply .....$125
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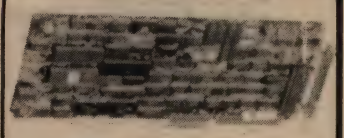
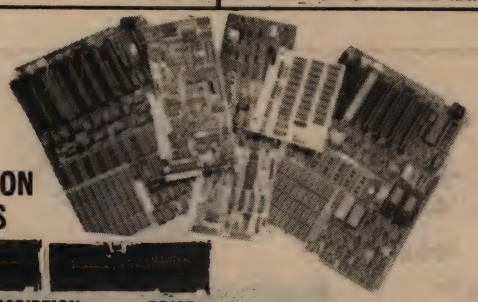
KYB-5061 AT Keyboard w/split Keypad$95
Case-90 AT Slide-case.....$89
FDD-1.2 1.2 meg drive .....$135
FDD-360 360K Drive.....$89



## VID-450 NEW!!

Hercules Compat. Monochome Graphics—Serial Port— Parallel Port—Game—Real Time Clock Cal. .....$145

## IBM ADD ON BOARDS



| STOCK# | DESCRIPTION | PRICE |
|---|---|---|
| FDC-501 | Floppy disk controller w/cable, 2 drives | $28 |
| FDC-507 | Floppy Cont. w/serial, parallel & clock | $85 |
| HDC-515 | Hard disk controller w/cables | $90 |
| VID-401 | Color Graphics Cards, IBM Specs. | $60 |
| VID-405 | Magic Video card w/TTL, RGB, & Composite outputs 640x400 color, 640x352 monochrome | $185 |
| VID-406 | Monochrome (TTL) card | $75 |
| VID-408 | Hi-Res monolgraphics w/printer port Hercules compatible | $85 |
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| PIO-255 | Parallel printer card | $29 |
| MFC-110 | Short I/O, parallel, serial, clk/cal | $65 |
| MFC-100 | Multi-funct. w/para., ser., clock/cal & 384K Exp., no mem. installed, software | $90 |
| MFC-120 | 576K memory expansion board (short card) | $39 |
| MFC-120 | 576K memory expansion board (short card) | $39 |
| EP-128 | EPROM burner board, for IBM (2716-27128) | $129 |
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## MOTHERBOARDS

STD XT-640 4.7MHZ-8 I/O slots 640K MAX-w/OK .....$115
**TURBO XT-640-8A** 640K Max. 5/8 MHZ, 2-layer board, tested with 0 mem..$135
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## FCC APPROVED KEYBOARDS

# KBMAXI—mfg. by Maxiswitch AT/XT selectalbe .....$79.95
**- KBMICRO—Mfg. by Microswitch 5151 Style-AT/XT selectable** .....$99

## KONAN THE CONTROLLER

Half-Card
Hard Disk
Auto-Config ROM
Formats All Drives
$90 w/cables

## HARD DRIVE KITS SPECIALS

10 Meg & Controller .....$305
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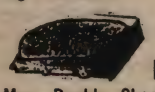

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**INCLUDES:**

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- AT Style Keyboard
- 6/8 MHz Switchable (10 MHz Optional)
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- Hard/Floppy Drive Controller
- System Reset Switch
- MS-DOS 3.1 Manuals and Diskette
- Users Manual w/Full Documentation
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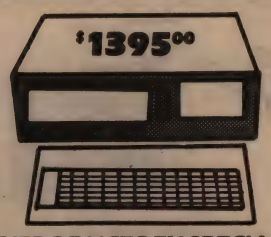


**INTRODUCTORY SPECIAL**

**WITH OPTIONAL:** $1995.00
- 20 Meg Hard Drive
- 1 Meg Ram
- TTL Monitor
- Mono/Graphic Card With Parallel Port

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**INCLUDES:**

- XT Style - 8 Slot Slide Case
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- Mono/Graphics Card
- Parallel Port
- 360 K Direct Drive Floppy w/Controller
- Legal Erso Bios
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- FCC Approved

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- AT Style Keyboard
- Hard/Floppy Controller Card
- Parallel Port
- Color Graphic Card
- 1.2 Meg Floppy Drive
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- Key Lock
- System Re-set Switch
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**$1995.00**

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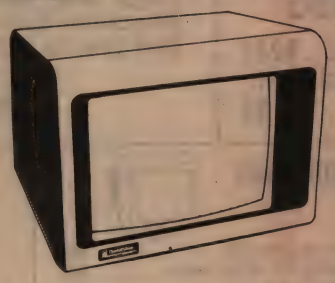
Padded Carry Case w/Pockets and Shoulder Strap.
**Free** With Each ULTRA-AT Portable System $99.00 **Value**

## GS GoldStar MONITORS



- 12" TTL Monochrome
- Amber or Green
- 900 Line Resolution at Center
- Brightness/Contrast Controls

**$99.95**

- 14" RGBI-TTL Color
- 640 x 240 Resolution
- 18 MHz Freq. Bandwidth
- 80 Character
- Brightness/Contrast Controls
- Non-Glare Screen

**$249.95**

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- 800 x 240 Resolution
- 30 MHz Freq. Bandwidth
- 80 Character
- Brightness/Contrast Controls
- Non-Glare Screen

**$299.95**

## TAPE BACK-UP SYSTEMS

### PHOENIX - ARCHIVE:

- 1/4 Inch Streaming System
- IBM PC, XT, AT Compatible
- 60MB Capacity
- 9 Track Serpentine
- QIC-36 Controller
- Image & File Backup & Restore
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- Controller, Cables, Software and Manual Included
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| | |
|---|---|
| Internal System | $595.00 |
| External System | $695.00 |
| 60 Meg Tape Cart. | $29.95 |

**DATA INSURANCE**

## DISK DRIVES

### HARD DISK:

- 20 Meg Kit* ..... $385.00
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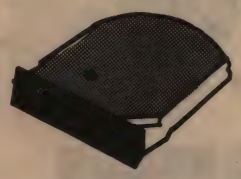
- 17 Meg Removable Hard Disk (Internal) ..... $995.00

***KIT INCLUDES:** Drive, Controller Cables and Installation Guide.



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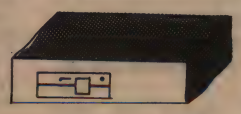

## COMPONENTS, PERIPHERALS, AND ACCESSORIES

### EXPANSION CARDS:

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|---|---|
| Floppy Controller w/Cable | 34.00 |
| Mono/Graphics w/Parallel Port | 79.00 |
| Color Graphics Card | 69.00 |
| EGA Card | 240.00 |
| Disk I/O Card - 2 Drives | 79.00 |
| Mini I/O Card Clock/Calendar - Parallel Port - Serial Port - Game Port | 69.00 |
| 384K Multi-Function Card w/0-K Ram | 85.00 |

### KEYBOARDS:

| | |
|---|---|
| AT Style (84 Key) | $69.00 |

### POWER SUPPLY:

| | |
|---|---|
| 135 Watt | 75.00 |

### CASE:

| | |
|---|---|
| 8 Slot Flip Top | 39.95 |

### ACCESSORIES:

| | |
|---|---|
| 41256 Ram Chips | $ 2.95 Ea. |
| 4164 Ram Chips | .90 Ea. |
| IBM Joy Stick (Controller) | 19.95 |
| IBM Mouse Emulator/Joy Stick | 49.95 |
| Printer Cable 6 Ft. | 8.95 |

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PC/XT-TURBO compatible. 4.77 & Full 8 mhz clock.
67% Faster then IBM. 640K RAM, 1-360K Drv
TTL Amber Mon., Mono-Graphics w/Par Port
8 slots total - Complete Ready-to-run.

~~$ 720~~ (Kit - ~~$ 650~~) ** $ 625
** $685

ADD-ONS for the PC-FX series:

| | | | |
|---|---|---|---|
| $ 14 | V-20 chip - increases performance | $ 55 | Disk I/O S/P/Game Clk & cntrlr upgrade |
| $ 85 | 2nd 360K floppy (Fujitsu - extra quite) | $ 15 | Maxi-Sw AT style keyboard upgrade |
| **$ 368 | 20 Meg Hard-Disk w/cntrlr & 5+ meg software | $ 30 | 5152 style keyboard upgrade |
| **$ 440 | 30 Meg HD w/cntrlr & 5+ meg free software | | |
| $ 20 | Mitsuba TTL monitor upgrade w/swivel base & anit-glare black screen | | |

More options below

The 12 mhz a-286 and a-386 machines are scheduled for delivery late Nov. Please Call.

## a286

PRO AT compatible. 8 mhz. 640K RAM
1-1.2 Meg Drv, TTL Mon. Mono-Graphics w/Par Port
8 Slots total, 200 watt PS. DOS or XENIX ready.
Includes Hard-Disk/Floppy Disk Controller.

~~$ 1560~~ (Kit - ~~$ 1460~~) ** $ 1350
** $1440

ADD-ONS for the a286 series:

| | | | |
|---|---|---|---|
| $1250 | 82 Meg 30ms HD w/partitning software | $Call | 8/10 mhz system |
| $ 105 | 2nd 360K floppy (TEAC w/white face) | $ 35 | Keyboard upgrade AT 5152 style |
| **$ 555 | 30 Meg Seagate 35 ms HD w/5+ meg software | $ 490 | SCO Xenix V 2.1.3 operating system |
| $ 730 | 40 Meg 35 ms HD w/partitioning & free software | | |

Upgrades for both FX and a286 series:

| | | | |
|---|---|---|---|
| $ 160 | Everex Edge card (replaces mono-grphca) | **$ 470 | EGA 14" mon. & card (replaces TTL) |
| $ 70 | 14" TTL (Quimax) w/swivel (replaces 12") | **$ 75 | MS DOS 3.2 w/GW BASICA |
| $ 230 | RGB 14" mon. & color card upgrade (replaces TTL) | | |

## ATP-FX / ATP-286

Same FX & a286 system housed in Affordable-Trans-Portable cases.
9" TTL Amber, 6 slots. ATP-FX has 135, ATP-286 has 200 watt PS.

Add $ 220 to above FX prices. Add $ 285 to above a286 prices.

The ATP-286 Portables will be stock, but in limited supply in Dec.
12 mhz ATP-386's are also scheduled for Nov/Dec. Call for Price.

Complete Multi-User XENIX and NOVELL Net-Ware systems available.

XMU-4 includes a286 10 mhz w/ total of 2.5 Meg RAM, 80 Meg Hard-Disk, 60 Meg Xenix Tape-Back-Up, SCO Xenix Op sys, 80287-8 co-processor installed, 8-port serial card (system expandable to 9 users simply by adding terminals), 3 - 14" Terminals, 3 - 50 ft calbes. $ 6730

NNS-3 includes a286 8 mhz w/ 80 meg Hard-Disk, G-NET file server system (1.4 meg bit rate - 2.2 mb ARC-Net or 10 mb ProNet and others available) w/3 FX workstations and 60 Meg Tape-Back-Up. System expandable to 256 users. All cables and Novell NetWare included. $ 7480

**1 year Free warranty on all ISHVAR systems.**
**3 Year Nation-wide on-site Warranty available.**

### Monitors:

| | |
|---|---|
| 12" TTL Amber Samsung | $ 82 |
| 12" TTL Amber w/built-in swivel base | $ 102 |
| 14" TTL Amber Quimax | $ 145 |
| 14" RGB (CGA) Monitor 320x200 / 640x240 | $ 320 |
| 14" EGA Mitsubishi EGA-CGA Monitor 640x350 | $ 415 |
| **CAD/CAM** Super-High Res Monitors/cards and turnkey systems available | |
| Micro-Vitek 895/DU 14" 800x400 w/Ultra-Graph-800 card | $1635 |
| Micro-Vitek 905/DN 14" Analog RGB w/Quintar Graph-Port-D card (832x630x120 colors) | $2430 |
| Micro-Vitek 945/CN 20" Analog RGB w/Viva-Gold card (1300x800x upto 512 colors) | $3570 |
| WYSE & Qume Terminals also available | |
| WYSE-30 or Qume QVT101-G (Amber = +$25) | $ 320 |

### Printers:

| | | |
|---|---|---|
| Citizen 120-D | 120 cps Dot-Matrix 10" | $ 195 |
| Citizen MSP-10 | 160 cps Dot-Matrix 10" | **$ 275+ |
| Citizen MSP-15 | 160 cps Dot-Matrix 15" | $ 375 |
| Citizen MSP-20 | 200 cps Dot-Matrix 10" | $ 360 |
| Citizen MSP-25 | 200 cps Dot-Matrix 15" | $ 490 |
| Citizen Premier-35 | 35 cps Daisy-whl 15" (w/trctr) | $ 525 |
| Huston Instruments | Plotters & Digitizers | $Call |
| Parallel prntr cable | (length = 6 foot) | $ 012 |
| LePrint Software | standard package w/5 type styles | $ 140+ |
| Canon Lazer | --LAZER Printer-- | $2085 |

+ Over 95% of this ad has been type-set & printed using the LePrint software and a Citizen MSP-10 printer on the a286. (Copy was reduced slightly)

### Add-ons:

| | |
|---|---|
| EGA hi-res color card 650x350 | **$ 200 |
| Everex Edge card (runs Color sftwr on TTL mon.) | $ 235 |
| 10 mhz AT RAM expansn cards w/1.5 meg (5 meg per card) | $ 520 |
| AT Western Digital HD/FD cntrlrs w/cables | $ 195 |
| 1200/300 Baud H. comptbl Modem plug-in card | **$ 105 |
| 2400/1200/300 Baud Internal Modem | **$ 205 |
| Micro-Soft Bus Mouse w/PC-PaintBrush | $ 128 |
| 20 Meg XT Hard-Disk, 1/2 hi w/contrlr | **$ 368 |
| 30 Meg 1/2 hi w/controller | **$ 440 |
| 30 Meg AT Hard-Disk (40 ms) Seagate | **$ 550 |
| 20 Meg Teac Tape-Back-Up w/controller & 1-tape (intrnl) | **$ 465 |
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- Color video card.....$89.00
- Color monitor.....$289.00
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| MPS 1000 Printer | $249.90 |
| C1902 Monitor | $298.00 |
| C1350 Mouse | $ 37.90 |
| C1660 300 Baud Modem | $ 49.90 |
| C1670 1200 Baud Modem | $148.90 |
| C64 Computer | $139.90 |
| 64C Computer | $ CALL |

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|---|---|
| Data Manager 128 | $ 37.77 |
| Swiftcalc 128 w/Sideways | $ 37.77 |
| Wordwriter 128 w/Spell Check | $ 37.77 |
| Partner 128 | $ 37.77 |
| All Four | $149.90 |
| Data Manager | $ 27.77 |
| Wordwriter | $ 27.77 |
| SwiftCalc | $ 27.77 |
| All Three | $139.77 |

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| Jet | $ 25.70 |
| Flight Simulator II | $ 31.70 |
| Scenery Disks 1-6 | $ 13.70 |
| Scenery Disk 7-12 | $ 13.70 |
| Scenery Disks 6 Pack | $ 69.70 |

### DIGITAL SOLUTIONS

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|---|---|
| Pocket Writer 64 | $ 23.77 |
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| Pocket Planner 64 | $ 23.77 |
| Pocket Planner 128 | $ 28.77 |
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| F15 Strike Eagle | $ 19.47 |
| Conflict in Vietnam | $ 22.77 |
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| Sony DSDD 5¼" | $ 9.97 |
| Memorex DSDD 5¼" | $ 8.97 |
| Precision DSDD 5¼" | $ 7.97 |
| Bonus by Verbatim DSDD 5¼" | $ 6.97 |
| Sony 3½" DSDD | $ 25.50 |
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| Winners 3½" DSDD | $ 24.00 |

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| VIC 1525 Graphics Printer | $ 99.90 |
| MPS 801 Printer | $ 97.90 |
| MPS 803 Printer | $109.90 |
| C1600 300 Baud Modem | $ 37.90 |
| Commodore Plus/4 | $ 79.90 |

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|---|---|
| Superbase 64 | $ 47.77 |
| Superscript 64 | $ 47.77 |
| Superbase 128 | $ 52.77 |
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|---|---|
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| Okimate 10 | $124.77 |
| Okimate 20 | $134.77 |
| Plug-N-Print C64 | $ 59.77 |
| Plug-N-Print Amiga | $ 69.77 |
| Panasonic 1091 | $224.77 |
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| Star NX 10 | $239.77 |
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| Epson LX 80 | $239.90 |
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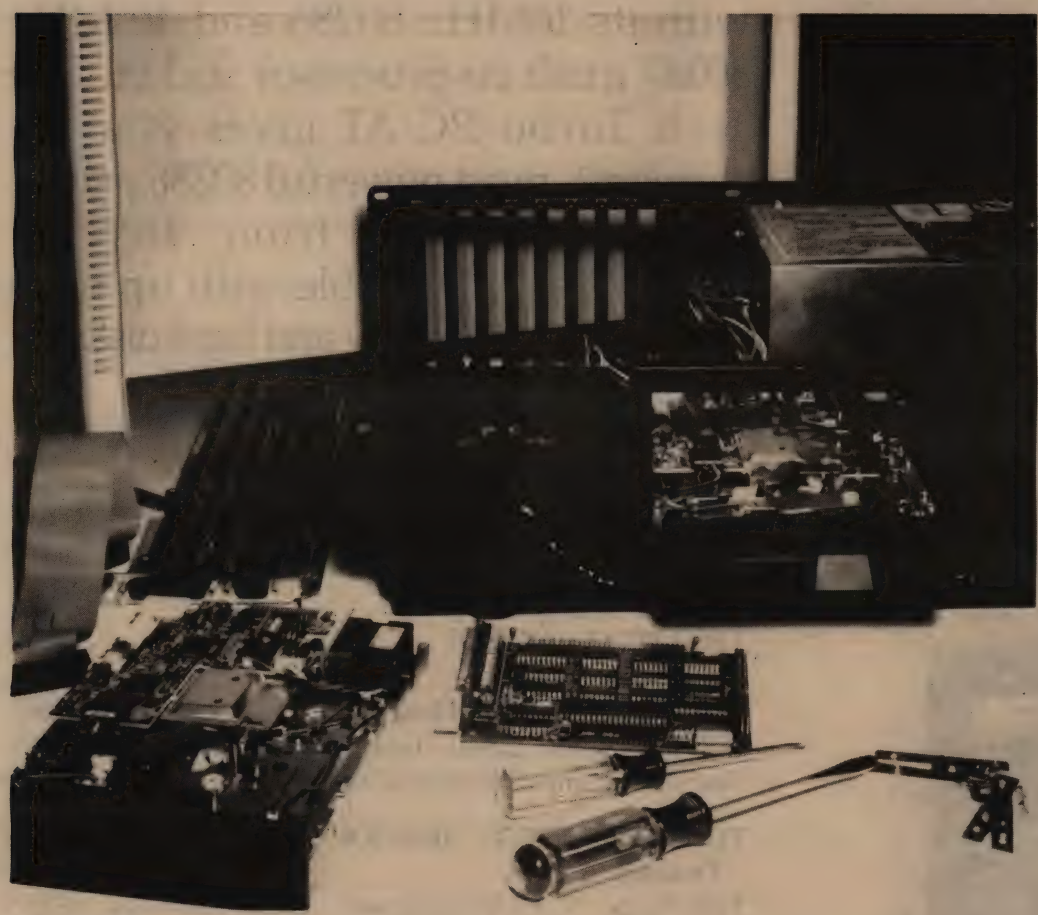

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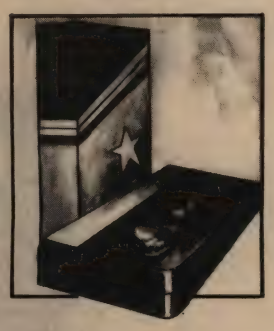

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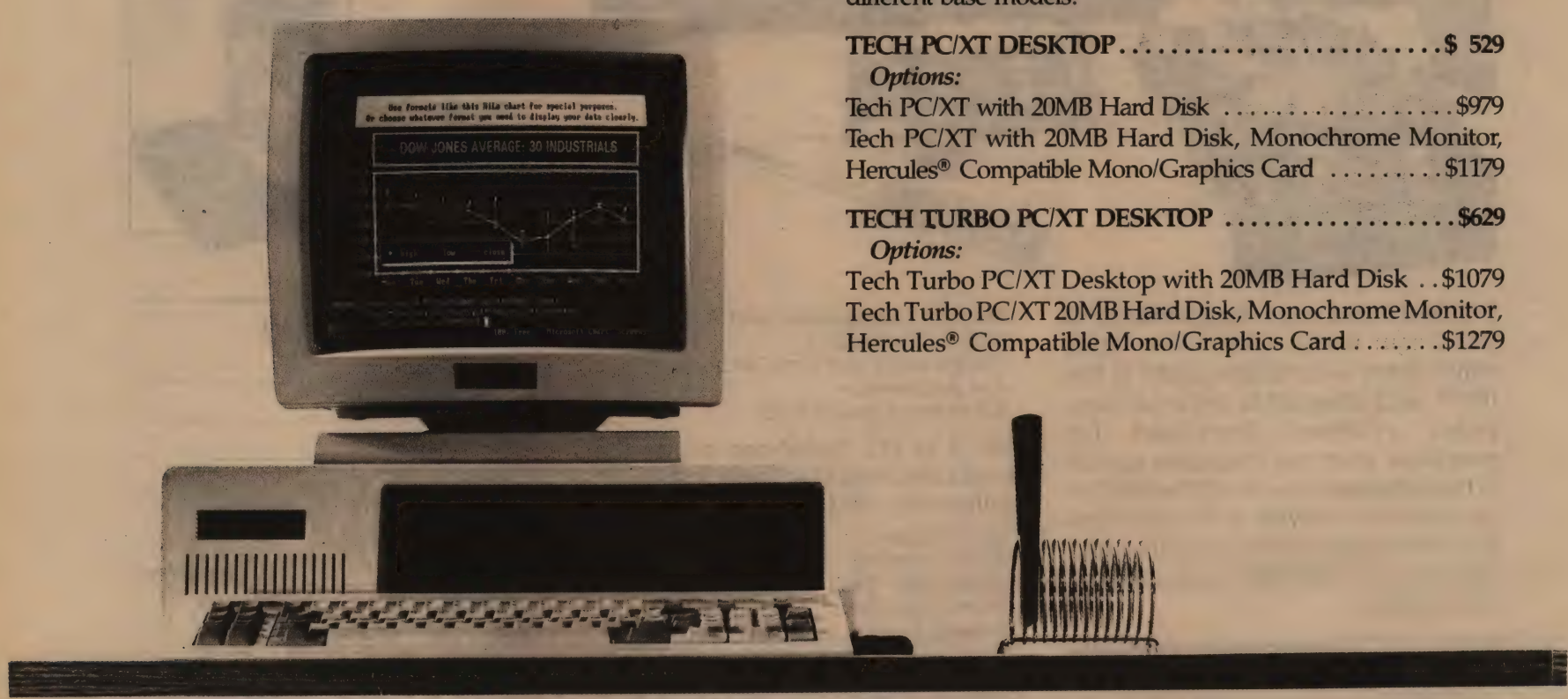


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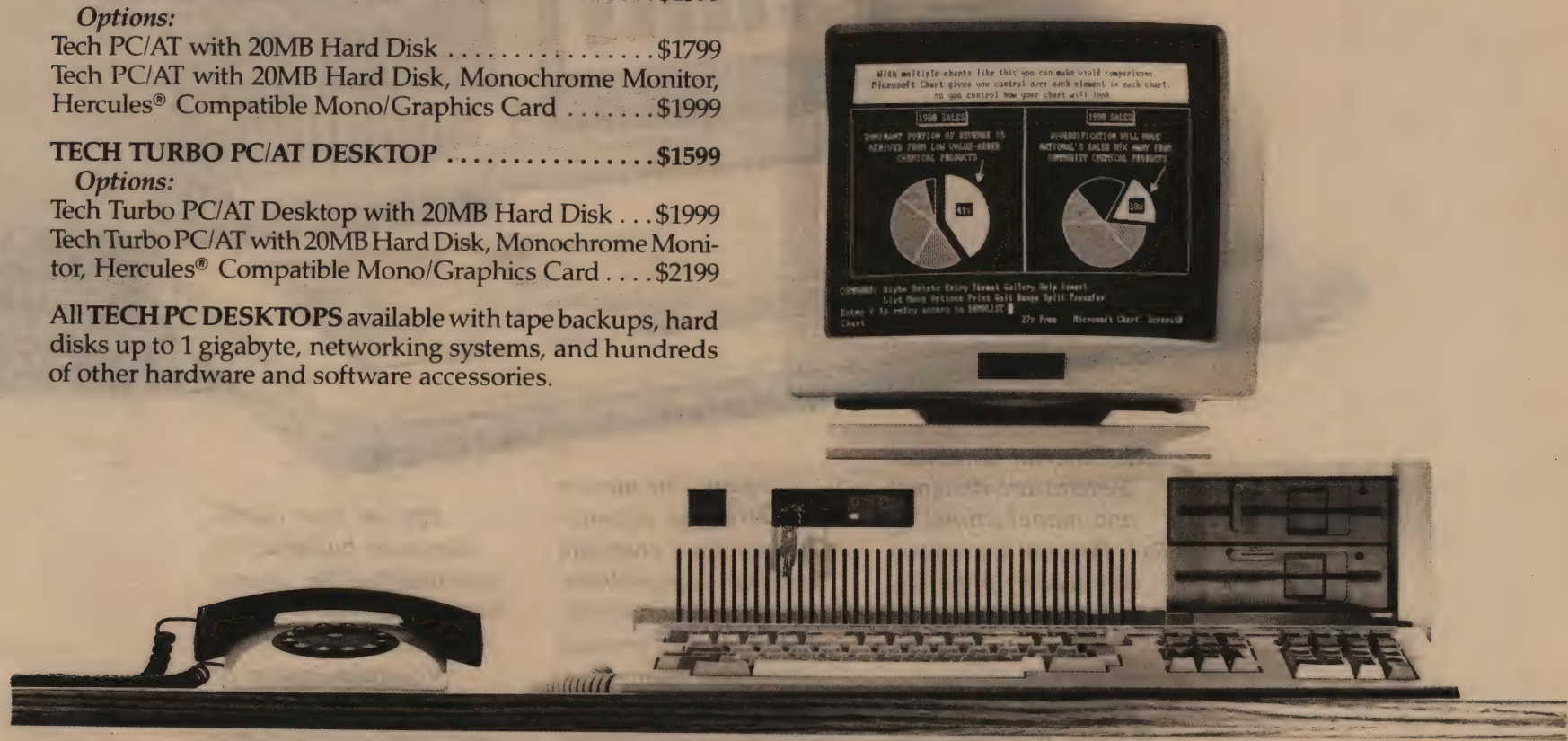

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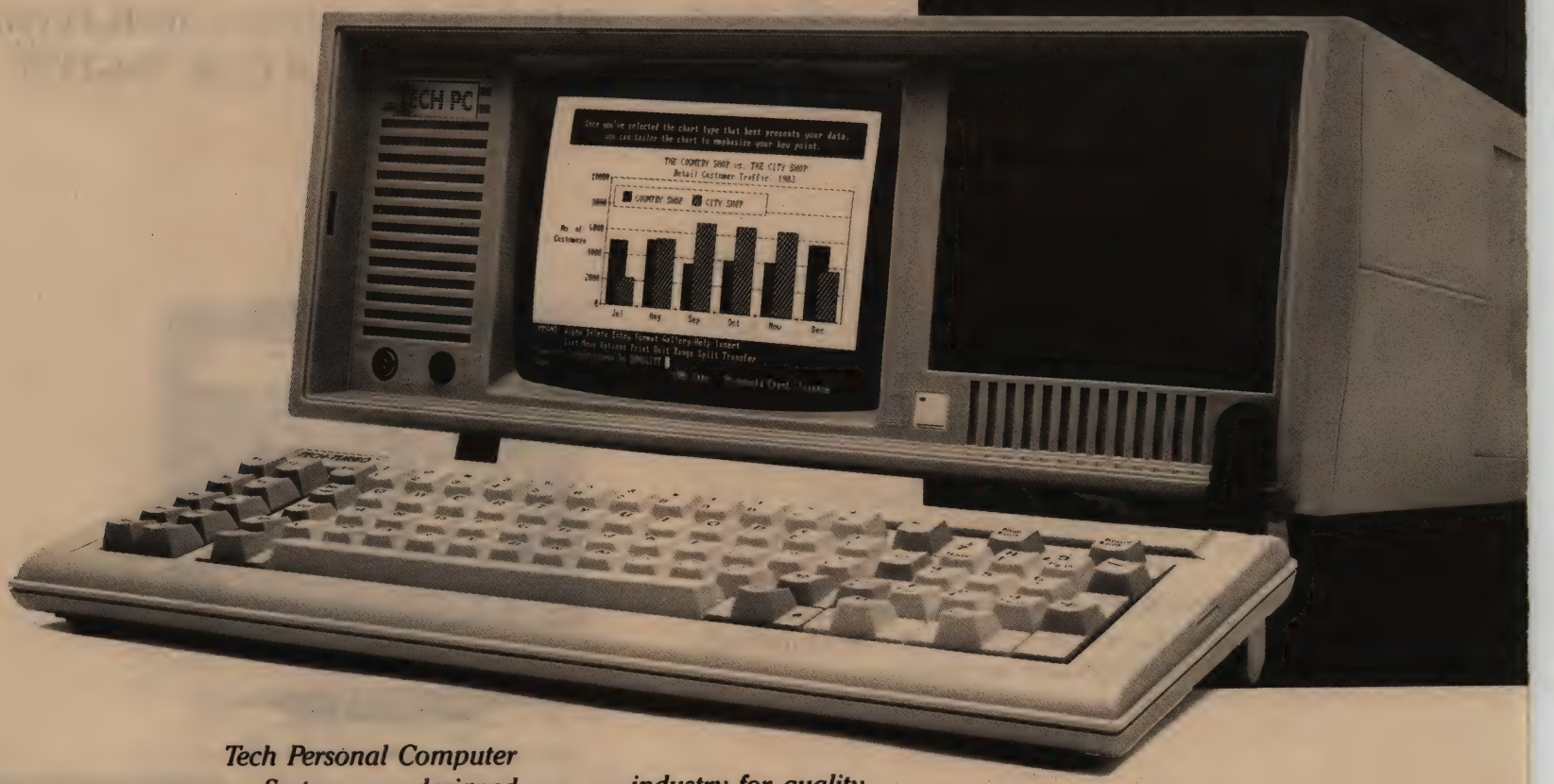


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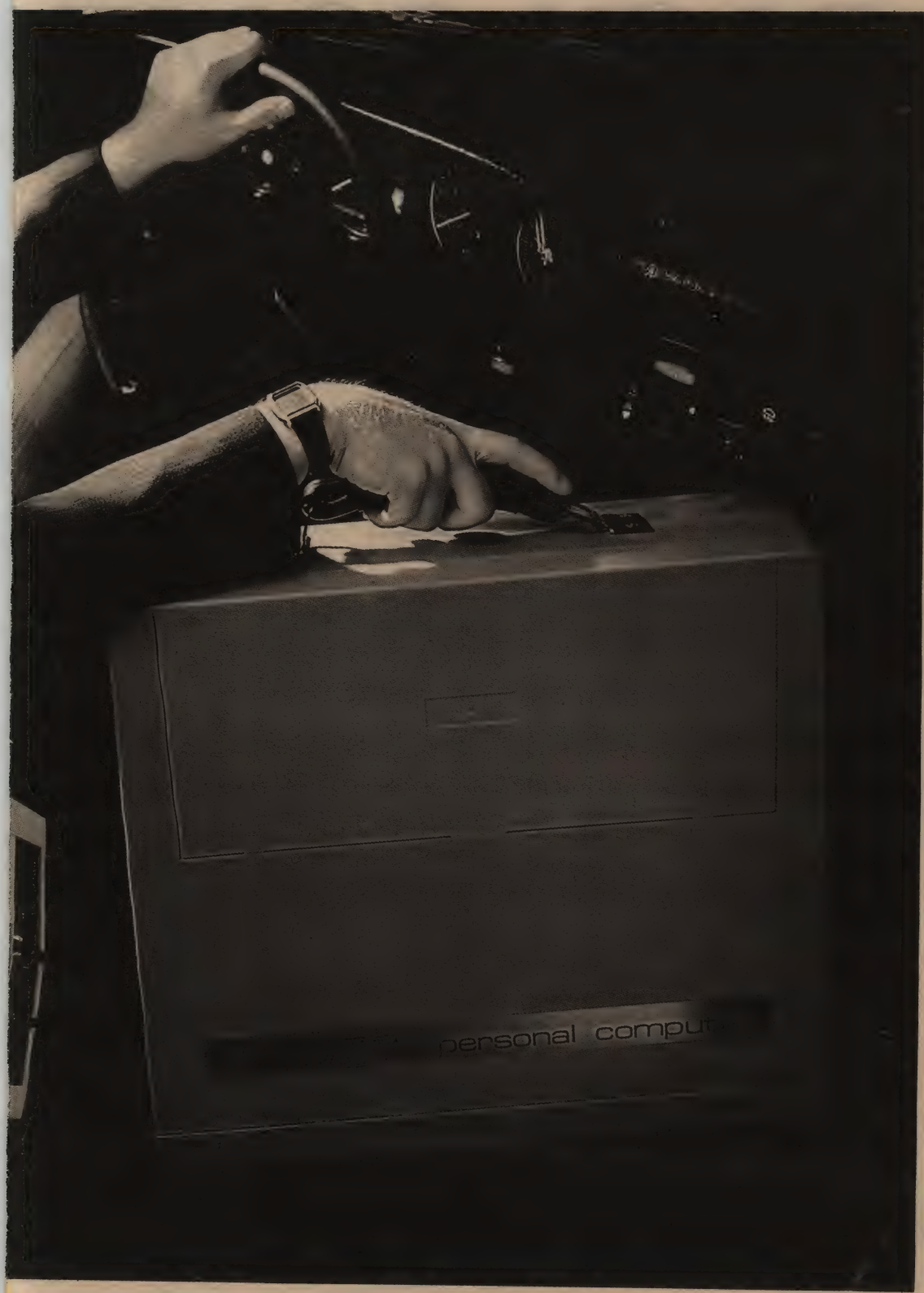


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The PC II series of IBM AT compatible computers are designed to leave your desktop feeling empty with the AT II Series' slim, non-obtrusive profile. Combined with a 14 inch, 800 by 400 line amber monochrome monitor or a 14 inch, 1280 by 800 black and white monochrome monitor you've got state of the art staring straight back at you. If 8 MHz 80286 power isn't fast enough for you . . . try the AT II Turbo with its 10 MHz 80286 and 10 MHz 80287 math co-processor socket. The AT II Turbo gives you the strongest most powerful 80286 unit performance available from anyone, anywhere . . . need some heavy duty memory, order the unit with 4 to 16 megabytes of memory . . . expanded or extended . . . your choice. How about hard disks . . . we've got those too. Up to 1 gigabyte removable or fixed memory storage with our new optical disk sub systems. Maybe you're worried about networking . . . we've

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Three 8 Bit Expansion Slots
150 Watt DC Fan Power Supply
AT Style Soft-Touch Hi-Tek Keyboard
One Year Warranty
Third Party Maintenance Options

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Tech PC/AT II System with Monochrome Monitor, and Hercules Compatible Mono/Graphics Card.

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Tech PC/AT II System with Monitor System Above, and 20 MB Hard Disk.

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Three 16 Bit Expansion Slots
Three 8 Bit Expansion Slots
150 Watt DC Fan Power Supply
AT Style Soft-Touch Hi-Tek Keyboard
One Year Warranty
Third Party Maintenance Options

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### PROGRAMS ON DISK

18 PC-TALK (Communications Package), Pacman 2, PC Notes
19 PC-FILE (Database Package)
20 Remote Bulletin Board System, Miscellaneous Utilities
21 Cross-reference Utility, Front-End Interface Utility (Monitor)
22 Expanding the Lister Utility for BASIC Programs
23 RATBAS, Warm System Restarts, Strip-Off Word* High Bits, Graphtrax Utilities
24 BASIC Games
25 BASIC Games
26 8087 Sampler Programs
27 KERMIT- PC/Mainframe Host Communications by Columbia Univ. (1 of 2)
28 KERMIT - PC/Mainframe Host Communications by Columbia Univ. (2 of 2)
29 Miscellaneous BASIC Programs
30 Misc. Appl. Sys: Cryptography, filing, Inventory, Mail List, Regression
31 PC-TALK III (Supercedes PC-TALK in volume 18)
32 PC-TALK III (Documentation, Miscellaneous Communication Systems
33 Misc. Applications: Compression Music, Dates, Sunrise, Plotting, etc.
34 dBASE and SuperCalc(tm) Templates
35 Miscellaneous Basic Utilities
36 IBM Keyboard Drill System
37 MODEM7 for IBM PC, Program Control System, WordStar Mods, Misc. Util.
38 Disk Directory Util., Squish REMarks, Lotus 1-2-3 Mods
39 Screen Editor, Primitive Word Proc. Memo Minder, History and Mult. Drills
40 EPISTAT Statistical Package, IBM MODEM Programs
41 Galaxy Trek with Graphics (Also works with Monocchrome)
42 A Cheap Assembler, Electronic RAM Disk, Misc. Utilities
43 Inventory Order Control System in dBASE II
44 PC Graphics by Eugene Ying
45 Bulletin Board System
46 Ringy Dingy Asynch. Communications Program, PC-FILE III
47 Software Encipherment, Misc. Util (Extracted from Capital PC)
48 Portfolio Evaluation System, Graphic Draw, Hi-Res Screen Print, Print Spooler
49 Remote Bulletin Board System: RBBS - CPC Ver 12.1
50 FreeCalc-Spreadsheet Program
51 Tax456-Lotus 1-2-3 Template for 1983 Income Taxes
52 New Key; Miscellaneous Utilities and Games by Vincent Bly
53 PC-Dial (Communications), PC-Write (Word Proc.), PC-Compare (File Mgt.)
54 FIG-FORTH (Vol. 1 of 2)
55 FIG-FORTH (Vol 2 of 2)
56 Utility 1-2-3 Utilities for Lotus 1-2-3
57 Ultra Utilities, Squeeze/Unsqueeze Library Update System, Disk Utility
58 Geneological System
59 EPISTAT Ver. 3.0, Statistical Package PC-Compare
60 Ten-Key (limited version), Media Magician (limited version), PC-Musician
61 Miscellaneous Basic Games
62 WITHDRAWN by author
63 Lotus Templates, Programmers Calculator, Touch Typing Practice, Print Spooler
64 Home Finance Program, Full Screen Editor, BASIC Program Optimizer, DOS 2 Utilities
65 Micro Accounting System, Mailsen Programs, Task Planning Program, Mail List System, Calendar Reminder
66 Miscellaneous Utilities
67 File Manager - Updated from Volume 30, Finance Manager, COMFAX Justify Program
68 DOS Menu Master, 8086/8087/8088 Disassembler, Miscellaneous System Utilities
69 Virtual Teaching Language Interpreter
70 Disk File Catalog Program-
71 Encipherment System Ver 1.53, PC-DOS Version
72 Super Encipherment, MS-DOS Ver 1.52
73 Tips, Notes, & Techniques for the IBM-PC
75 Property Management (dBase II Ver 2.4 required)
76 Updated Communications System Kermit
77 One RD Modem Communications
78 PC Write VS 2.4
79 RAM-drive quadram Memory
80 Multi-function Util., Experimental Lisp. Fog Finder, ID & execute
81 Library Update, Poor Man's Mouse, "Talking" PC, PC-DOS Help, Util.
82 8083 FORTH Ver 2.1
83 Finance Manager, Personal Date Book
84 Lotus Power Worksheets
85 Gludraw-line Graphics System
86 Roff (MS-DOS) Test Editor Ver 1.6 Extended Batch Language Ver 2.0
87 Listmate, PC-Check
88 Family Tree, Letters n' Labels, Banner Generator
89 Disk Copy, Small Sprdsht, Global Pathing, DIR Commands, TOS Printer
90 Supertrek, Ver 1 of 3 FORTRAN Source Code 8087 Needed
91 Supertrek, Ver 2 of 3 FORTRAN Source Code 8087 Needed
92 Supertrek, Ver 3 of 3 FORTRAN Source Code 8087 Needed
93 IBM PC User's Group Newsletter 11/84
94 PC-DOS 2 Help, dBase II Mail-list, comXmod, Sys Clock Reminder
95 Word Processor for Kids, Checkbook/Ledger Util. File Listing
96 Fido Bulletin Board System, Ver 10.0 Ver 1 of 2
97 Fido Bulletin Board System, Ver 10.0 Ver 2 of 2
100 U.S. Census Utility Ver 1 of 2
101 U.S. Census Utility Ver 2 of 2
102 Games, 3D Demon Chs, Catch Baby, Castle Adventure, Janitor Joe
103 Pascal Games, Third Dimension 3D Graphics Generator
104 Misc. Util.: Window Pop-up, Disk Patch, Hex Conv., WordStar ASC Refmt
105 Misc. Util.: Unix Term Emul, Com Library Ptdt, dBase II/III mnu
106 Modem Programs: PC-TALK III Ver 5, PC-TALK for Jr., IBModem for Jr.
107 Modem Programs: Kermit Ver 2.26, Qmodem Ver 2.87e
108 XDir, dBase Phone Util., Time Keeper Ver 1.4, Exended Batch Lang
109 Part 1 of 2
110 Multi-User RBBS Ver 12.3b Incl Source Capital PCug)
111 MS-DOS + Turbo Helps, ASCII to Lotus, Epson MX80, Stack Commands, Hebrew
112 LU Unfolds .LBR, UnSQueeze, dBase + BasicA Menu Maker, Def Func Key, Amortze
113 Time and money Ver 1.1: A Simple Financial Monitor
114 PC-Talk III .EXE and DOC, QModem for 103A, Daily Diary
115 ScreenWrite Formatting Program, PC/Calculator
116 dBase Genealogy, db Church Mgmt, db Checkbook Mgr (need LU)
117 Genealogy on Display v3.0
118 PCTalk (.exe) V2.1 Host III QModem Dialer
119 NewKey v2.1, 3 Kermit V 2.27
120 Investment Record System, Check Reconciliation, New Fonts, Menu Generator
121 General Ledger Accounting, Merge Plan, Multiplan Consolidator, Misc. Utilities
122 Symphony Applications, Medical, Banking Worksheets
123 Lotus Graphics Printer Symphony Insurance Worksheets
124 Lotus 123 Worksheets, Macro Conversion Aid
125 3x5 Info Management v1.0
126 File Express v2.95 1 of 2
127 File Express v295 2 of 2
128 Prolog v1.32 Spacewar Game, Bluesbox-Music Generator
129 Xlisp v1.4
130 PC Write v2.4
131 PC-DBMS v1.0
132 ORIGAMI, Color Graphics and Japanese Paper Folding
133 Personal Management — Deskmate V1. — Partner V1.1
134 Label Master
135 PC-Magazine Laboratory Bench Mark Series #1
136 Personal Accounts Manager V1.1 Disk #1
137 Personal Accounts Manager V1.1 Disk #2
138 RBBS V12.5A Capitol-PC — Vol 1 of 2 system
139 RBBS V12.5A Capitol-PC — Vol 2 of 2
140 PIBT Term V2.0 — Terminal Emulator, Juidy V1.01 Desktop Utilities
141 PC-CALC and AModem
142 Misc Utilities, Archieve, Examine RAM, List & File Managers, UnsQ
143 PC-TALK III V2.2 — Termulator V1.0 Kermit/SModem V3.2 Minitel
144 Misc Utilities, Create Bat, Bly's Uts. , SciCalc, Capstock, File Encrypt
145 1,2,3 to dBase III, TurboPascal Patches, WS P)atches, Double DOS V1.0
146 XLisp V1.5
147 Fun & Games
148 Potomac Eng 1 of 2, Database, Spreadsheet Expert System
149 Potomac Eng 2 of 2, Database, Spreadsheet, Expert System
150 Flow System Organizer, Visible Pascal
151 Misc Utilities, Auto Dex, CHKDSK, Diskcopy, Screen Ed, REN, WS Convert
152 Confident V2.0 Encryption Pgm, Symphony Macro Conversion
153 Fun & Games
154 Small Database, SDB V2.0 — Ron Cains SMALL-C V1.1
155 RBBS V12.5b Capitol-PC
156 TBBS V12.5b Capitol-PC
157 Prolog. Artificial intelligence Sample
158 AnalytiCalc-86 — Vol 1 of 2 — Integrated Spreadsheet
159 AnalytiCalc-86 — Vol 2 of 2 — Integrated Spreadsheet
160 Geneology on Display V3.1
161 Fansi-Consol V1.11/1.13 — Consol Driver
162 Personal Typing, S-Ray, OmniEdit, DOS Assistant V2
166 PFSA Program for Simple Algebra
167 PCWrite V2.55 Word Processor & Editor
168 pBase V1.02, PC-Recipe, SL-Sidelines (dBase III)
169 The Mailman V2.0 — Mail List Management, Learn V.06
170 PIBTerm V3.0 VT100 Terminal Emulator, Butler V1.03 Commercial Communications
171 Escreens. Create interactive Color Graphic Screens
173 ChiWriter V1.3 SCI Notation Word-Pro, BradFord V1.2
174 ESIE V1.1 Expert System interface Engine, Comet Finder
175 ZModem V1.12 TryVmsym V1.1 for Symphony, Proindex V1.2
176 Church Management and "She Expert," a knowledge system
177 PD Labels, Letterwriter — An address book, DOS-amatic.
178 Games; Cavequest, Naval War Simulator, ARROR - Turtle graphics.
179 BENCHMARKS from PC Magazine Lab Series No. 2
180 ACCUTAX 86 — 1985 Tax Preparation System.
181 PC DPS-KAT Vs. 1.2 — A super capacity disk cataloger.
182 FREEWORD Vs. 1.0 — A word processor.
183 PROLONG PD Vs. 1.8 — Artificial intelligence;
184 PC-Tax 85 — 1985 Tax Preparation System.
185 Z-80 CP/M 2.2 Emulator for PC-DOS.
186 NYWORD — Word Processor; WSID — Wordstar5 index system.
187 QMODEM Vs. 1.13 VINTRO — Tutorial on NEC V20/V30 CPU.

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### 100% IBM Compatible

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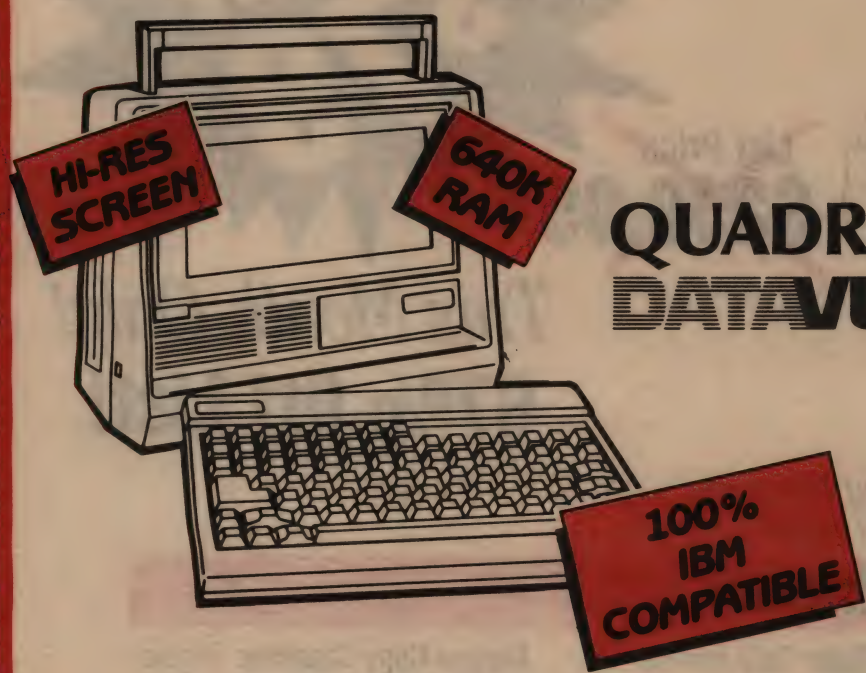


**QUADRAM DATAVUE™ 25**

~~Mfr. Retail $1995.00~~

*The Ideal Computer For Accountants, Students, Realtors, Businessmen—Anyone On The Go!*

LAPTOP COMPUTERS

## Loaded With Features!

• 640K RAM • Weighs Only 12 Pounds • Built-in RAM Disk • Adjustable CGA Compatible LCD Screen • 80 x 25 Text, 640 x 200 Hi-Res Graphics • 1 5¼" 360K DSDD Floppy Disk Drive • Detached Keyboard • Parallel and Serial Ports • Clock/Calendar • 90 Day Manufacturer's Warranty

### Why Such A Bargain?

The Quadram Datavue 25 is one of the finest laptop computers on the market. Standard equipment includes one 5¼" disk drive with a built-in RAM disk, and an infrared wireless detached keyboard with optional cable. It also features an incredibly high resolution adjustable LCD screen, capable of both text and graphics. Among the numerous options available are a rechargeable battery pack, a durable carrying case, a second floppy drive and an internal modem.

It weighs only 12 pounds and easily stores under an airplane seat with room to spare. You can take it on trips or on client and site visits. Students can even take it to class to take notes.

The Datavue 25 is completely IBM compatible and runs Lotus 1-2-3, WordStar, Reflex, Sidekick, MultiMate, dBase III+ and any other IBM compatible program.

So why are we selling this fantastic computer at such an incredibly low price? The answer is simple. Quadram first introduced the Datavue two years ago, receiving rave reviews from PC Magazine and several other industry publications. Recently, Quadram has introduced another version of the Datavue, featuring a gaslit twisted LCD screen, and has concentrated all their marketing efforts on it. As a result we were able to acquire the original version at a great price, and we're passing the savings along to you.

They come with Quadram's 90 day warranty and, of course, our 15 day 100% satisfaction guarantee. At this price, these computers won't last long, so order yours today!

### 100% Satisfaction Guarantee

90 day warranty from Quadram plus 15 day trial. If you are not satisfied with this computer for any reason, simply call to return it within 15 days of receipt for a complete refund.

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| QD640-C12 | Quadram Datavue 25 | $799 | $15 |
| QB100-C12 | Battery Pack | $59 | $5 |
| QC200-C12 | Carrying Case | $45 | $5 |

### Options Available

Rechargeable Battery Pack
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*Product Information*
1-202-944-3900, 9 AM - 8 PM, EST, M-F

*Customer Service Inquiries*
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## $79 Letter Quality Printer

ONLY $79

List Price ~~$239.95~~

*This Month Only!*

**67% Off List!**

LQ PRINTERS

### The ROYAL Letter Master

- *Works with IBM, Apple, etc.*
- *Works with Most Popular Word Processing Programs*
- *Perfect for Small Businesses, Students or Home Use*

### Features

- 10 CPS Bi-Directional Printing
- Print Pitch and Line Feed Selectors
- 84 Character Print Buffer
- Handy Reference Guide
- Automatic Bold Printing
- Automatic Underlining
- Variable Form Length Settings
- Variable Tabulation Settings
- Variable Right Margin Settings
- 94 Character Elite Printwheel

### Specifications

**Character Type:** Fully formed daisywheel characters
**Printwheel:** 10/12 Elite ASCII 94 character printwheel
**Print Method:** Bi-directional logic seeking
**Print Speed:** 10 CPS (8 CPS Shannon Text)
**Print Buffer:** 84 characters
**Columns Per Line:** 66 @ 10 CPI, 80 @ 12 CPI
**Print Line Width:** 6.6 inches
**Maximum Paper Width:** 8.5 inches
**Carbon Copy Capacity:** Original plus 3 copies
**Paper Feed:** Friction feed
**Front Panel Controls:** Test Print Key, Start Print Key, Print Pitch Selector, Line Feed Selector
**Indicators (LED):** Power On, On Line
**Interface:** Parallel centronics
**Size:** 4.5"(H) x 13.5"(W) x 10.8"(D)
**Weight:** 7.9 lbs.

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| RY800-C12 | Royal Letter Master Printer | $79 | $12 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

***This price good through December 15, 1986.***

### 100% Satisfaction Guarantee

90 day warranty from Royal plus 15 day trial. If you are not satisfied with this printer for any reason, simply call to return it within 15 days of receipt for a complete refund.

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### Ordering Information

Please specify Product Number when ordering. We ship UPS Ground anywhere in the continental USA. Allow three weeks shipping time. To return an item, call Customer Service (1-800-231-3549) for an authorization number. Quantities of all items are limited. Order Now!

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# Letter Quality Printers!

## 14 CPS Daisywheel

76% OFF LIST

Transtar 120 **$129**

*A Letter Quality Printer At A Dot Matrix Price!*

- 14 CPS
- Portable
- Lightweight

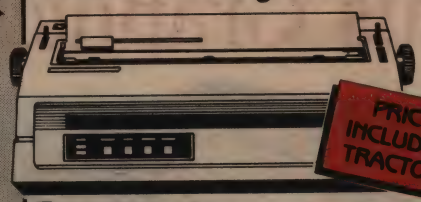
- Parallel and Serial Models Available
- Diablo Compatible—Works With Most Popular Word Processing Programs
- Both Have Automatic Paper Loading
- 6 Month Warranty

### Specifications

**Print Speed:** 14 characters per second *(cps)* *(Shannon Text)*
**Print Method:** fully formed daisywheel characters
**Character Set:** ASCII 96-character, upper and lower case
**Character Spacing:** 10, 12, and 15 cpi, switch selectable
**Horizontal Spacing:** 1/20th-inch increments
**Vertical Line Spacing:** 1/48th-inch increments
**Forms Width:** 13 inches maximum
**Line Feed Speed:** 2 inches per second
**Carriage Return Speed:** 1200 ms per 10 inches
**Ribbon:** fabric or mylar *(single strike)* cartridge, Olivetti compatible
**Printwheel:** 96-character plastic daisywheel, 10, 12, and 15 cpi
**Interface:** Model 120P: Centronics-compatible 8-bit parallel; Model 120S: XON/XOFF or ETX/ACK protocol
**Baud Rates:** Model 120S: 300, 600, 1200, 2400, 4800, and 9600 bits per second *(switch selectable)*
**Buffer Size:** Model 120S: 1790 bytes
**Parity:** Model 120S: Even, Odd, None *(switch selectable)*
**Code Compatibility:** Plug and software compatible with Diablo 1610/1620 routines *(except two-color ribbon)* for full feature compatibility with leading word processing packages
**Software Enhancements:** Software selectable form length from 1 to 126 lines
**Paper Thickness:** Original plus 3 copies *(maximum)*
**Automatic Paper Loading:** Autoload function loads paper to one of four switch-selectable positions
**Power Requirements:** 120 VAC 60 Hz at 1.5 amps
**Noise:** 65 dB(A) or less
**Dimensions:** 17.5"(W) x 4.8"(H) x 12.4"(D)
**Weight:** 18.7 lbs.

## 19 CPS Daisywheel

*Wide Carriage With Tractorfeed*



PRICE INCLUDES TRACTOR

70% OFF LIST

Transtar 130 **$249**

*With Tractorfeed And Sheetfeeder* ONLY **$329**

- Parallel and Serial Models Available
- Diablo Compatible—Works With Most Popular Word Processing Programs
- Both Have Automatic Paper Loading
- 6 Month Warranty

- 19 CPS Bi-Directional Printing
- Proportional Spacing
- Automatically Loads Single Sheets to One of Four Selectable Positions

### Specifications

**Print Speed:** 20 CPS (18 CPS Shannon text)
**Print Method:** Fully formed daisywheel characters
**Character Set:** ASCII 96 character, full upper and lower case
**Character Spacing:** 10, 12 and proportional, switch selectable
**Form Width:** 17" maximum
**Line Feed Speed:** 4" per second
**Ribbon:** Cartridge type, fabric or mylar, Olivetti compatible
**Printwheel:** 96 character plastic daisywheel
**Interfaces:** Model 130P—Centronics parallel; Model 130S—RS232C (DTR, XON/XOFF, ETX/ACK)
**Baud Rates:** Model 130S—300, 600, 1200, 2400, 4800, 9600 (switch selectable)
**Compatibility:** Diablo 1610/1620
**Paper Thickness:** Original plus 4 copies
**Auto Paper Loading:** Autoload function automatically loads single sheet paper to one of four switch selectable positions: first printable line, 1" down, 1½" down, or 2" down
**Sensors:** End of Ribbon, Cover Open, Ribbon Jam
**Panel Indicators:** Power, Alert, Print On
**Control Panel Switches:** Autoload, Line Feed, Page Eject, Pause/Continue
**Power Requirements:** 120 VAC 60 Hz at 1.5 amps
**Dimensions:** 23"(W) x 7.5"(H) x 14"(D)
**Net Weight:** 31 lbs.

LQ PRINTERS

## Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| TS120P-C12 | Transtar 120 Parallel Printer | $129 | $17 |
| TS120S-C12 | Transtar 120 Serial Printer | $129 | $17 |
| TS130P-C12 | Transtar 130P Parallel Printer w/Tractorfeed | $249 | $22 |
| TS130S-C12 | Transtar 130S Serial Printer w/Tractorfeed | $249 | $22 |
| TS999-C12 | Sheetfeeder for Transtar 130 (Available only with purchase of printer) | $80 | $7 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

### 100% Satisfaction Guarantee

6 month warranty plus 15 day trial. If you are not satisfied with this printer for any reason, simply call to return it within 15 days of receipt for a complete refund.

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## *7 Color Ink Jet Printer*

## Does Lotus Graphics!

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COLOR PRINTERS

Mfg. Sug. Retail ~~$699.00~~

Liquidation Price **$199**

Canon PJ-1080A

### Features:

- Seven bold colors—red, blue, yellow, green, magenta, cyan, black
- Quiet, high-speed-prints at 37 cps and under 50 dB
- High resolution—640 dots per line
- Advanced drop on demand ink jet printing system
- Large capacity ink cartridges—approx. 3.2 million characters per color
- Black or white reversible background
- Automatic vertical and horizontal tabulation
- Page length per inch setting
- International character sets selectable
- Overhead projection film can be used

### Specifications

**Printing method:** Drop on demand ink jet printing
**Print head:** Piezo-electric type
**Nozzle:** Four horizontally arranged nozzles
**Printing direction;** Bi-directional line scanning
**Printing characters:** Character composition: Standard 5x7 dot matrix; Character set: full ASCII character set (96) and special characters; Character size: 1.5 x 2.7mm (standard), 3.0 x 2.7mm (enlarged)
**Maximum characters per line:** 80 chars per line standard, 40 chars per line enlarged
**Image printing:** Image data: vertical 8 dot information; Resolution: 560 dots per line
**Color hard copy:** Data: horizontal 8 dot information; Resolution: 640 dots per line
**Interface:** 8 bit parallel interface (Centronix type)
**Paper:** Paper type: plain paper; Roll paper: max width 8½" max., diameter 2¾"; Single sheet: max width 8½"
**Overhead projection film:** A-4 single sheet (Canon specified only)
**Ink cartridge:** Type: dual-cartridge ink supply; Ink amount: black-25cc, other colors—20cc each; Ink life: approx. 3.5 million characters per color
**Physical dimensions:** Size: 15¾" x 11⅝" x 4¼"; Weight: 12.3 lbs.

*Created with Lotus 1-2-3 Release 2*

BCE Canon PJ-1080A

PRINT SAMPLES

### Works With These Popular Software Packages:

**Lotus 1-2-3 Release 1A**
- PC Paintbrush • PFS Graph
- PFS Write • Colorscreenprint

**Lotus 1-2-3 Release 2**
- Snapshot • Infographics
- Keychart • Telescan Analyzer
- Chart, Decision & Sign Master

**Lotus Symphony**
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- PJ-Handler

**And More...**

Send Check or Money Order or Charge

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| C710-C12 | Canon PJ-1080A Printer | $199 | $12 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

### 100% Satisfaction Guarantee

One year factory warranty plus 15 day trial. If you are not completely satisfied for any reason simply call us within 15 days for a full refund.

Quantity Discounts Available

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**1-800-545-7447**

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### Ordering Information

Please specify Product Number when ordering. We ship UPS Ground anywhere in the continental USA. Allow three weeks shipping time. To return an item, call Customer Service (1-800-231-3549) for an authorization number. Quantities of all items are limited. Order Now!

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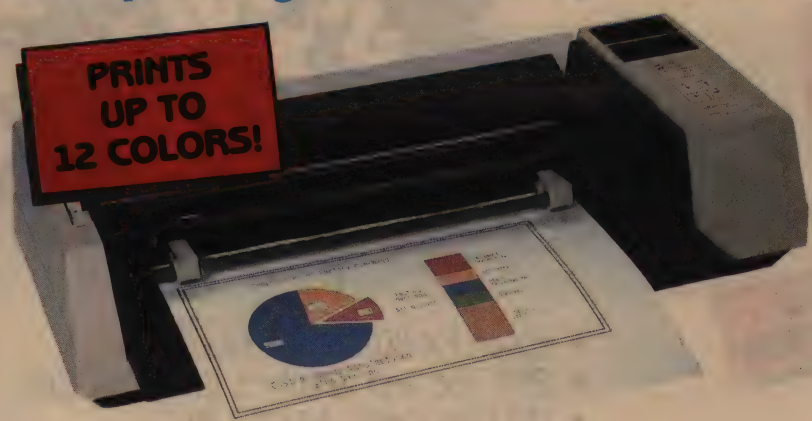
# Plotter Liquidation!

*Completely HP Compatible!*




UP TO 50% OFF LIST

**Model 4550**
*Narrow Bed Plotter*
ONLY $399
Mfr. Retail
~~$795.00~~

**Model 4551**
*Wide Bed Plotter*
ONLY $699
Mfr. Retail
~~$995.00~~

PLOTTERS

## FACIT 4550/4551 Plotters

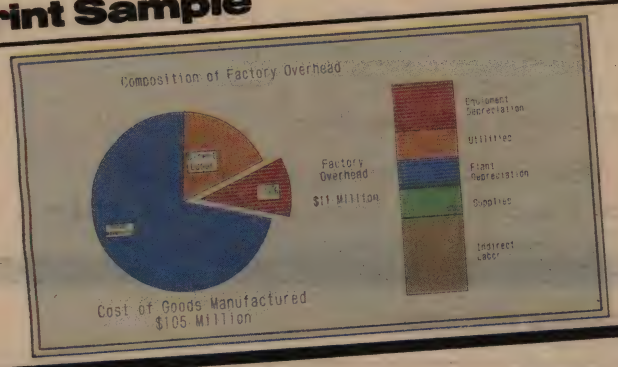
***Wide Bed and Narrow Bed Models Available***

- Hewlett Packard Graphic Language (HP-GL) Emulation
- Use for Business Graphics or CAD/CAE Drawings • Roller Bed Technology • Prints In 12 Colors (6 Pens Per Cassette)
- Small Footprint • Prints on Paper or Overhead Film • 3D Capability • 6 Pen Cassette • Parallel and Serial Interfaces Standard

**Specifications**

| | Facit 4550 | Facit 4551 |
|---|---|---|
| Media Sizes | A4 (ANSI A) 8" x 11" | A3 (ANSI B) 11" x 17" |
| Plotting System | Moving Paper/Moving Penhead | |
| Pen Types | Ballpoint, 0.4mm | |
| Number of Pens | 6 per Cassette | |
| Colors | 8 to 12 | |
| Pen Velocity | Paper: 150mm/sec | Paper: 200mm/sec |
| | Overhead Film: 60 or 100 mm/sec | |
| Resolution | 0.1 mm | |
| Repeatability | 0.2 mm | |
| Accuracy | ±0.3% ±0.2 mm | |
| Graphic Commands | HP Graphic Language | |
| Alpha Commands | HP Graphic Language in 16 National Versions | |
| Character Speed | Alphanumeric Characters: approx. 4.5 CPS<br>Character Resolution 32 x 32 | |
| Input Buffer | 2K | |
| Interfaces | Parallel (Centronics) and Serial (RS-232) | |
| Protocols | READY-BUSY, XON-XOFF, ETX (ENQ)-ACK | |
| Power | 100/115 V or 220/240 V | |
| Dimensions L x W x H | 440 x 285 x 132 mm<br>17 x 11 x 5 inches | 525 x 285 x 132 mm<br>20.5 x 11 x 5 inches |
| Weight | 6.0 kg 13.3 lb | 6.85 kg 15.2 lb |

**Print Sample**




**100% Satisfaction Guarantee**

90 day manufacturer's warranty plus 15 day trial. If you are not satisfied with this plotter for any reason, simply call to return it within 15 days of receipt for a complete refund.

**Ordering Information**

| Product # | Item | Price | Shipping |
|---|---|---|---|
| FA550-C11 | Facit 4550 Narrow Bed Plotter | $399 | $15 |
| FA551-C11 | Facit 4551 Wide Bed Plotter | $699 | $17 |

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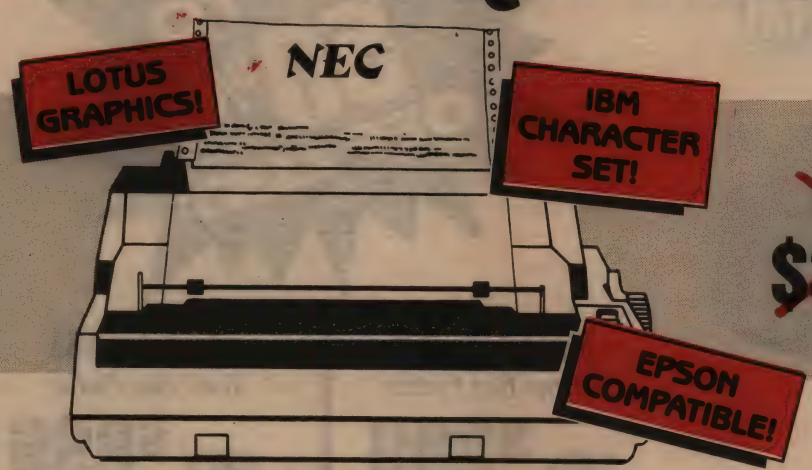
# Incredible Value! BCE

## NEC® NLQ Printer!




Model PR105A

Mfr. Retail ~~$399.00~~

ONLY $149

- Epson FX-80 Compatible
- IBM Text and Graphics Character Sets
- 110 CPS Draft, 46 CPS NLQ
- Tractorfeed Included
- True Lower Case Descenders

MATRIX PRINTERS

### Specifications

| | |
|---|---|
| **Printing Method:** | Impact Dot Matrix |
| **Print Head:** | Impact Line Dot Type, 16 pin |
| **Character Sets:** | ASCII and Italic ASCII characters; International and Italic International Characters; IBM Graphics Printer Graphics; IBM Matrix Printer Block Graphics |
| **Control Code Sets:** | NEC Standard; IBM Graphics Printer; Epson FX-80 |
| **Characters Per Inch:** | High Speed Pica 10 CPI, enlarged 5 CPI<br>High Density Pica 10 CPI, enlarged 5 CPI<br>Elite 12 CPI, enlarged 6 CPI<br>Condensed 17.1 CPI, enlarged 8.57 CPI |
| **Characters Per Line:** | High Speed Pica 80 CPL, enlarged 40 CPL<br>High Density Pica 80 CPL, enlarged 40 CPL<br>Elite 96 CPL, enlarged 48 CPL<br>Condensed 137 CPL, enlarged 68 CPL |
| **Printing Speed:** | High Speed Pica 92 CPS, 69 LPM<br>High Density Pica 46 CPS, 34.5 LPM<br>Elite 110 CPS, 68.8 LPM<br>Condensed 78 CPS, 34.2 LPM |
| **Character Composition: (V x H)** | High Speed Pica 7 x 9 dots<br>High Density Pica 13 x 9 dots<br>Elite 7 x 7 dots<br>Condensed 7 x 9 dots |
| **Buffer Size:** | 4K Bit image type |
| **Paper Feed:** | Friction and Tractorfeed |
| **Paper Type:** | Cut Sheets or fanfold up to 10" wide |
| **Paper Thickness:** | Up to 0.10mm |
| **Number of Copies:** | Original plus two copies |
| **Ribbon:** | Black cartridge ribbon with 1 million character life (high speed pica) |
| **Interface:** | Centronics, 8 bit parallel |
| **Dimensions:** | 13¾"(W) x 5½"(H) x 10"(D) |
| **Weight:** | 15.3 lbs. |

### Print Sample

How did NEC make a printer this good? You're looking at the unretouched correspondence-quality printout of NEC's new PC-PR105A IBM* Compatible dot matrix printer. Note the smooth letter forms and the true descenders on the lower-case q, y, p, g, and j.

How did NEC make a printer this fast? This draft-quality type was printed out at a speedy 110 characters per second.

How did NEC make a printer this flexible? Take a look at this NEC's graphic talents. The PC-

### 100% Satisfaction Guarantee

90 day warranty from NEC plus 15 day trial. If you are not satisfied with this printer for any reason, simply call to return it within 15 days of receipt for a complete refund.

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| NC105-C12 | NEC PR105A Printer | $149 | $15 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

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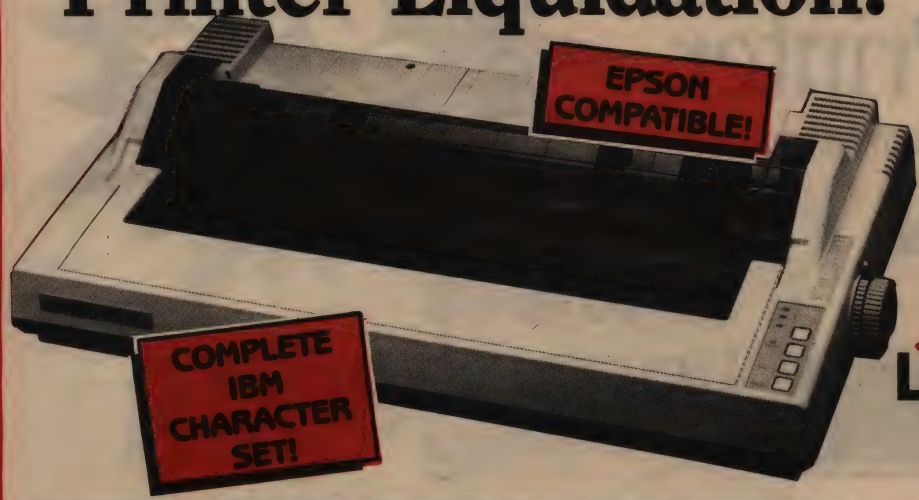
# Wide Carriage NLQ Printer Liquidation!




**57% OFF LIST**

~~List Price $699.00~~

**Liquidation Price $299**

MATRIX PRINTERS

## C.ITOH® RITEMAN 15

- 160 CPS Draft, 32 CPS NLQ
- 53 Lines Per Minute Throughout
- Switch Selectable NLQ Mode
- Switchable Push/Pull Tractorfeed
- 15″ Carriage
- 8K Buffer
- Parallel Interface
- 1 Year Warranty

## Print Sample

```
The high speed draft mode of the
C.Itoh Riteman 15, combined with its
15" carriage, makes it perfect for
spreadsheets and other printouts.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890-={};/!@#$%^&*()
The Near Letter Quality mode is
ideal for all types of business
correspondence.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890-={};/!@#$%^&*()
```

## Specifications

**Print Speed:** 160 CPS Draft, 32 CPS NLQ. Logic seeking, bi-directional
**Print Head:** 9 wire dot matrix
**Paper Feed:** Tractorfeed and friction feed standard
**Character Set:** Full 96 character ASCII and italic, true lower case descenders. 32 block graphics, all IBM graphics, 8 international characters. Emulates IBM and Epson printer codes.
**Print Size/Mode:** Standard Pica: 10 CPI, 136 characters per line; Standard Elite: 12 CPI, 163 characters per line; Compressed: 17 CPI, 233 characters per line; Expanded: 5 CPI, 68 characters per line. Also supports double strike, italics, emphasized, superscripts and subscripts.
**Graphics Bit Image:** Horizontal density of 816, double density of 1632 dots per line. 1:1 mode, 979 dots per line. Column scan bit image, 8 × N.
**Line Spacing:** 1/16″, 1/8″, 7/72″, programmable n/72″, and n/216″
**Form Length:** Standard 66 line
**Buffer Size:** 8K standard
**Power Supply:** AC 115 Volt 50/60 Hz, stepper motor
**Ribbon:** Compact cassette, 2 million character life
**Size:** 4¾″(H) x 13″(D) x 23¼″(W)
**Weight:** 21 lbs.

### 100% Satisfaction Guarantee

1 year warranty from C.Itoh plus 15 day trial. If you are not satisfied with this printer for any reason, simply call to return it within 15 days of receipt for a complete refund.

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| CT15-C12 | C.Itoh Riteman 15 Printer | $299 | $22 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

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MATRIX PRINTERS

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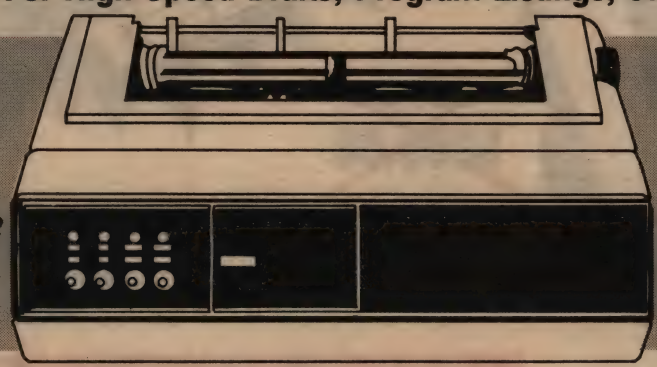
## Liquidation! 400 CPS Heavy Duty Printer

For High Speed Drafts, Program Listings, etc.

76% OFF LIST

*180 Lines to 340 lines per minute*



Mfr. Retail ~~$2495.00~~

**Liquidation Price $599**

## Diablo P38

- 400 CPS Bi-Directional Dot Matrix Printing
- High Reliability—No Maintenance Required. No Adjustments
- Long Life Ribbon
- Built-In Tractorfeed For Rear Or Bottom Paper Feed
- Parallel Interface

### Specifications

**Character Format:** 7x7 matrix
**Characters per second:** 400± 5%
**Lines per minute:**

| | | | | |
|---|---|---|---|---|
| Characters per line | 40 | 60 | 80 | 132 |
| Lines per minute | 340 | 260 | 220 | 140 |

**Line Feed Speed:** 55 msec, 8″ per second
**Print Head:** 14 pin design
**Character Sets:** Standard—96 Character ASCII; Selectable—7 National character sets selected via toggle switch.
**Line Length:** 132 characters
**Buffer Capacity:** 256 characters max.
**Character Density:** 10 CPI Standard
**Form Length:** 3½″ to 14″, selectable via rotary switch
**Line Density:** 6 LPI Standard
**Ribbon Cartridge:** Black, available in normal (2 million character life expectancy) and long life (8 million character life expectancy).
**Paper:** Fanfold paper, 3″ to 15″ fed from either rear or bottom of feed slots through width-adjustable tractors.
**Copies:** Original plus four copies (more if carbonless paper used). Multiple copy lever located inside printer case.
**Power requirements:** 120 VAC, 60 Hz, 170 Watts max, +10/–15%
**Dimensions:**

| | |
|---|---|
| Size | 22.0″(W) x 16.1″(D) x8.2″(H) |
| Weight | 39.5 lbs. (18 kg) |

### Print Sample

```
89 `abcdefghijk !!<=>?@ABCDE
789 `abcdefghijk !!<=>?@ABCD
6789 `abcdefghijk !!<=>?@ABC
56789 `abcdefghijk !!<=>?@AB
456789 `abcdefghijk !!<=>?@A
3456789 `abcdefghijk !!<=>?@
23456789 `abcdefghijk !!<=>?
123456789 `abcdefghijk !!<=>
0123456789 `abcdefghijk !!<=
/0123456789 `abcdefghijk !!<
 /0123456789 `abcdefghijk !!
& /0123456789 `abcdefghijk !
%& /0123456789 `abcdefghijk
```

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| DP38-C12 | Diablo P38 Printer | $599 | $27 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

### 100% Satisfaction Guarantee

Full 90 day manufacturer's warranty plus 15 day trial. If you are not satisfied with this printer for any reason, simply call within 15 days of receipt to return it for a complete refund.

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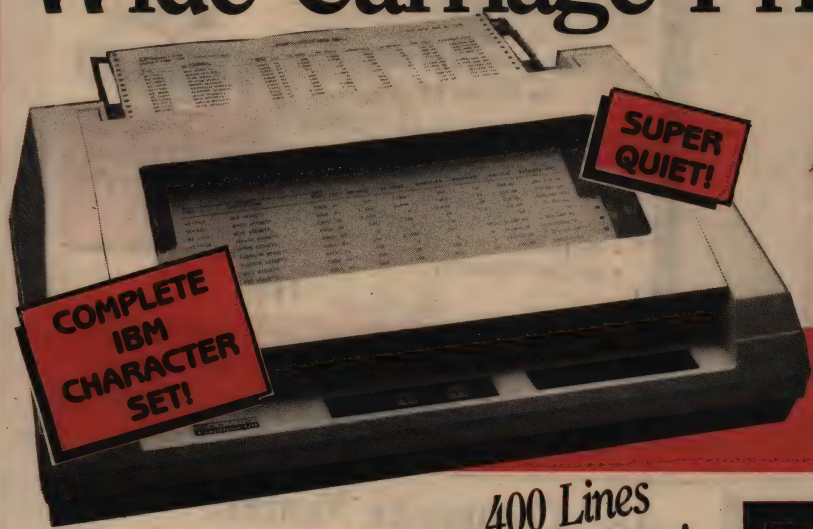
# Liquidation!
# 420 CPS/NLQ Wide Carriage Printer

65% OFF LIST




Mfr. Retail
~~$2495.00~~
**Liquidation Price $799**

**EPSON COMREX CR420**
*Same as Epson 420i*

*400 Lines Per Minute!*

## Does IBM Graphics!

- 417 CPS Draft, 104 CPS NLQ
- Complete IBM Text and Graphics Character Sets
- Type Styles Selectable from Front Panel
- Built-In Tractorfeed—Rear and Bottom Feed
- Parallel *and* Serial Interfaces
- 18K Buffer
- Built-In Acoustic Cover
- Heavy Duty Construction
- 1 Year Factory Warranty

## Specifications

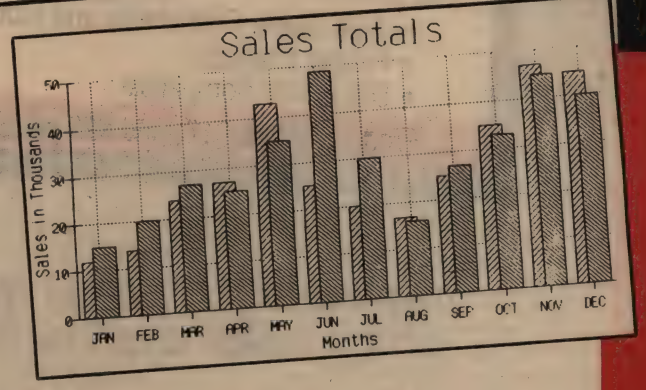
**Print Method:** Impact Dot Matrix **Print Direction:** Bidirectional Logic Seeking **Print Speed:** 417 cps Standard 10, 12, 16 Pitch, 208 cps Boldface & Super/Subscript, 104 cps Near Letter Quality **Number of pins:** 8 (Staggered Arrangement) **Character Set:** IBM PC Compatible, Low & High Order Character Set **Character Styles:** Draft—10, 12, 16, and 20 Pitch Near Letter Quality—10, 12, and Proportional Pitch **Character Attributes:** Boldface, Italicized, Expanded, Super/Subscripted, Underlined **Interfaces:** Parallel Centronics and Serial RS-232C **Baud Rate:** 1200, 2400, 4800, 9600 **18K Input Buffer:** Standard **Indicators:** Power On, Paper Out, On-line **Switches:** Power On/Off, On-Line, Top of Form Set, Form Feed, Line Feed Reset **Detectors:** Paper Out and Error Detection Alarm **Print Head Life Expectancy:** 200 Million Characters **MTBF (Excluding Print Head, Life):** 3200 Hours at 25% Duty Cycle & 30% Page Density **Ribbon Type:** Cartridge **Ribbon Life Expectancy:** 10 Million Characters, Draft, 78 Million Characters, Correspondence **Power Consumption:** 175 Average Watts (Printing), 55 Watts (Standby) **Paper Feed:** Friction and Pin Feed **Form Width:** 4⅞"–15½" **Copies:** Original plus Four (maximum thickness 0.0118", carbonless) **Paper Path:** Rear and Bottom **Dimensions:** 23.4"(W) x 7.6"(H) x 15.9"(D) **Weight:** 60 lb. **Front Panel Selection of:** Nine Fonts, Nine Forms Lengths **Acoustal Noise:** 60db(A) **Standard Accessories:** Cassette Style Ribbon, Single Color; Paper Rack, User's Guide

MATRIX PRINTERS

**100% Satisfaction Guarantee**
1 year factory warranty from EPSON plus 15 day trial. If you are not satisfied with this printer for any reason, simply call to return it within 15 days of receipt for a complete refund.

## Print Sample

Correspondence
Elite
Proportional
Condensed
Expanded
Emphasized
Super and Subscript
Underline
Italics




## Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| C420-C12 | Epson/Comrex 420 Printer | $799 | $29 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

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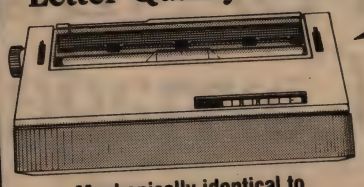
## Just A Few Left...

## *Last Chance!*

### 33 CPS Wide Carriage Letter Quality Printer

**$395**



**Mechanically identical to the Brother HR-35**

~~Mfr. Retail~~ ~~$1245.00~~

*Parallel and Serial Models Available*

- 33 CS Bi-Directional Printing
- Easily Changeable Daisywheel Cartridges
- 7K Buffer
- 90 Day Warranty

*We can't print the manufacturer's name in our ads, but we can tell you when you call.*

Sheetfeeder **$119**

*Parallel Model—Product #BR35P-C12, $22 shipping.*
*Serial Model—Product #BR35S-C12, $22 shipping.*

### 40 CPS Wide Carriage Letter Quality Printer

**$349**

**FACIT 4565**

Made by TEC *(Manufacturer of C.Itoh Starwriter F10-40)*

*This printer is mechanically identical to the Commodore 6400 printer that we have sold for the past 9 months.*

- Uses Diablo Printwheels and Ribbons
- Parallel Interface
- Diablo 630 Compatible

Product #F565-C12, add $22 shipping.

### 12" Composite Monitor

**$49**

Made by **Taigye**

- Works With IBM, Apple, Commodore, etc.
- Amber Picture Tube
- 40 or 80 Column Mode
- RCA Type Cable Included
- 60 Day Warranty

*Product #CM004-C12, $12 shipping.*

LAST CHANCE

*Telephone orders only on **"Last Chance" items.** All items subject to prior sale. For complete details on these products, see our ads in the November issue of Computer Shopper. **Order Now!***

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Best Buy

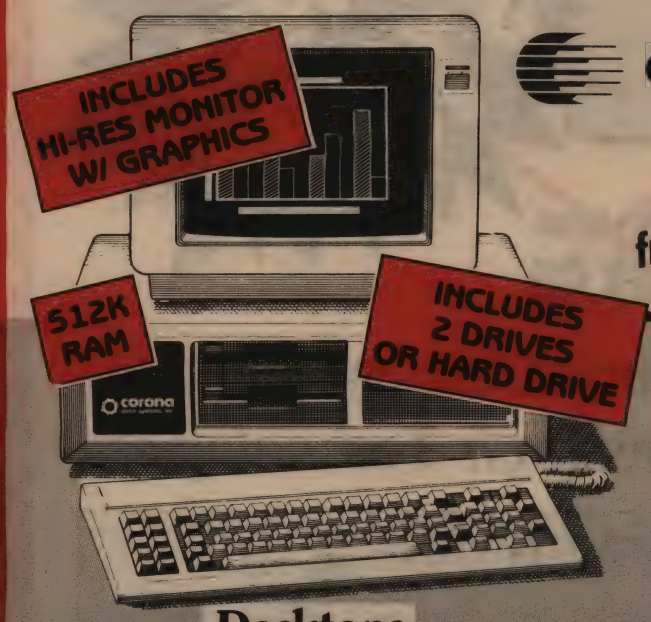
## 100% IBM Compatible Computer Liquidation!

UP TO 61% OFF LIST

Formerly corona data systems, inc.

**cordata PC 400 Series**

from $799



COMPUTERS

### Desktops

All desktop systems come with 512K RAM, 14" green high-resolution (640 x 400) swivel/tilt monitor with graphics, detached selectric style keyboard, 4 full length expansion slots, serial and parallel ports, MS-DOS, GW Basic and PC Tutor.

**System A**
- 512K RAM on Motherboard
- 2 Half Height Floppy Drives—Space Available For Hard Drive

ONLY $849

**System B**
- 512K RAM on Motherboard
- 10 MB Hard Drive
- 1 Half Height Floppy Drive—Space Available For an Additional Half Height Drive

ONLY $979

### Portables

All portable systems come with 9" green high resolution (640 x 400) monitor with graphics, detached selectric style keyboard, 4 full length expansion slots, serial and parallel ports, MS-DOS, GW Basic, and PC Tutor.

**System C**
- 256K RAM on Motherboard
- 2 Half Height Floppy Drives

ONLY $799

**System D**
- 512K RAM on Motherboard
- 1 Half Height Floppy Drive—Space Available For an Additional Half Height Floppy or Hard Drive

ONLY $849

**System E**
- 512K RAM on Motherboard
- 2 Half Height Floppy Drives

ONLY $929

**System F**
- 512K RAM on Motherboard
- 10 MB Half Height Hard Drive
- 1 Half Height Floppy Drive

ONLY $1099

COMPUTER SHOPPER Best Buy OF THE YEAR

*Our earlier version of the Cordata PC, model PC325, was voted Computer Shopper's "Best Overall Buy of 1986," based on a subscriber survey. Now we've got an enhanced version, model PC400, with built-in monochrome graphics for only $49 more! Plus hard drive systems! A Best Buy for 1987!*

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| CR401-C12 | Corona PC400 Desktop-System A | $849 | $29 |
| CR402-C12 | Corona PC400 Desktop-System B | $979 | $29 |
| CR403-C12 | Corona PC400 Portable-System C | $799 | $23 |
| CR404-C12 | Corona PC400 Portable-System D | $849 | $23 |
| CR405-C12 | Corona PC400 Portable-System E | $929 | $23 |
| CR406-C12 | Corona PC400 Portable-System F | $1099 | $23 |

### 100% Satisfaction Guarantee

All Cordata hardware is covered by the manufacturer's 90 day warranty. All additional disk drives are covered by their own individual warranties. Plus, if you are not satisfied with any system for any reason, simply call to return it within 15 days for a complete refund.

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## Customize Your Keyboard!

Lets you enter several software commands or a word or paragraph with one keystroke!

ONLY $19.95

SMART KEY Keyboard Macro Utility

Mfr. Retail ~~$69.95~~

**For IBM PC and Compatible Systems**

*Made by Software Research Technologies*

SOFTWARE

### SmartKey *Version 4.1*

- Lets You Save Time and Effort By Eliminating Repetitive Keystrokes (Enter Several Software Commands or a Word or Paragraph With One Keystroke)
- Has Predefined Macros for **Lotus 1-2-3, WordStar** and **dBase**
- Lets You Customize Any Software Package By Creating Your Own Macro Definitions
- Operates in the Background—Activate SmartKey at the Touch of a Key
- Lets You Customize Your Keyboard—Move Any Key to a Different Location
- Extremely Easy to Use
- Works With Any IBM PC or Compatible Computer

YOU ALSO GET FREE!

### SmartPrint Print Utility, Version 4.1

- Lets You Create Specialized Print Modes With One Keystroke

**Wide Print** Superscripts
Condensed Subscripts
**Emphasized** Underlines
*Italics*

- Works With Any Epson Compatible Printer

"Can you imagine a computer without SmartKey? I can't and I have a vivid imagination."
**William F. Buckley**

"A must for every computer."
**Peter McWilliams, The Word Processing Book**

**100% Satisfaction Guarantee**

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**All the essential features of WordPerfect 4.1 at 15% of the price!**

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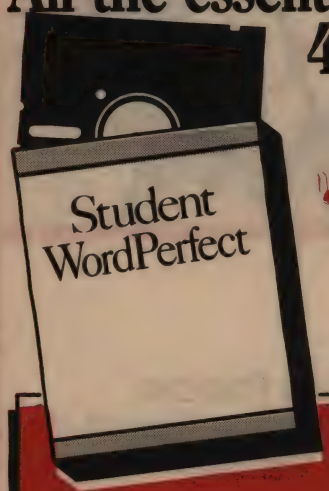


- *On-Line Thesaurus*
- *115,000 Word Spelling Checker*
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- *Automatic Outlining*

**Note:** This offer available **only** to students and faculty at recognized educational institutions. See conditions below.

**For IBM PC, XT, AT and Compatible Systems**

SOFTWARE

- WordStar and MultiMate Data Conversion • Automatic File Backup • On Screen Bolding, Centering and Underlining • Automatic Page Numbering • Password File Security • Proportional Spacing • Automatic Formatting • Extensive Printer Support

***Mail orders only on this item. Read "Terms and Conditions" at right.***

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Please send me _____ copies of Student WordPerfect at $75.00 each. I am enclosing $3.00 shipping and handling per unit. ($15.00 per unit for Canadian shipments.)
Make checks payable to **BCE**.

Name _____

Address _____

City _____ State _____ Zip _____

Phone ( _____ ) _____

**Method of Payment:** ☐ Check Amount $ _____

☐ MasterCard ☐ Visa ☐ Choice ☐ American Express

Account # _____ Exp. ___/___

Signature _____

(I) (We) hereby certify that this order is submitted by a student enrolled at a recognized educational institution.

Institution _____

Signature _____

### *Requirements*

Student WordPerfect will run on IBM PC's, XT's, AT's and all compatible systems. It requires 192K RAM, two double sided disk drives and DOS 2.0 or later.

### *Terms and Conditions*

Student WordPerfect is an exclusive offering of BCE. Availability and specifications are subject to change without notice. This program is offered by BCE solely to students and faculty at recognized educational institutions. BCE, at its sole discretion, reserves the right to refuse any order.

No telephone orders will be accepted for this item. All student order forms must be signed by a faculty member. Please use the form provided or a reproduction thereof. All faculty orders must be received on school letterhead. Please allow 4-6 weeks for delivery for this item.

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## Lotus 1-2-3®
Look-Alike

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## The Twin

*For IBM and All Compatible Systems*

SOFTWARE

- Reads and Writes Lotus Files
- Superior Graphics To Lotus
- Work Area—256 Columns by 8,092 Rows (Same as Release 2 of Lotus)
- Supports 8087/80287 Math Coprocessors
- Not Copy Protected
- Free Customer Support
- 1 Year Warranty

## Specifications

• 255 by 8192 worksheet area • Macros, both keyboard and global with iteration and user defined • Macro compatibility • Reads and writes 1-2-3 data files directly • Financial Functions: FV, PV, PMT, RATE, MIRR, NPV, IRR, NPER • Statistical Functions: MIN, MAX, STD, VAR, COUNT, SUM, AVG • Database Statistical Functions: DSUM, DAVG, DCOUNT, DVAR, DSTD, DMIN, DMAX • Logical Functions: #NOT#, #AND#, #OR#, TRUE, FALSE, IF, AND, OR, NOT, ISNA, ISERR, >, <, =, >=, <=, < > • Mathematical Functions: +, -, *, /, ACOS, ATAN, ASIN, COS, TAN, SIN, ABS, EXP, INT, LOG, MOD, PI, ROUND, SQRT, ATN ±, SQRT, RAND LN • Selection Functions: CHOOSE, HLOOKUP, VLOOKUP • Date Functions: DATE, TODAY, DAY, MONTH, YEAR • Translate data from other programs without exiting program • Configure hardware with easy to use input from screen, without exiting program • Flexible color definition of the TWIN on your screen • Print Headers and Footers with date and page number functions • Graphics created directly from spreadsheet data • Pie charts 2-D, 3-D • Pie-Bar combination • Colors and shading definable for each slice • Slices can be exploded • Vertical bars 2-D clustered, 2-D stacked, 3-D clustered • Colors and shadings for bars user definable • Bar top labels • X-axis, Y-axis, and grids are optional • Line charts of up to 8 lines per chart • Color and line type for each line is user definable • Linear or LOG axis in any combination • All charts have 3 lines of titles and 3 lines of footnotes. Each 8 sizes, 8 different colors, different fonts, left-center-right justified • 11 different text fonts • Plotting with plotters on paper or transparency • Hercules and color monitors supported • Simultaneous display on 2 monitors • 2 level graphics. Analysis and Presentation • Special "FILL-IN-THE-BLANKS" INPUT FORMS • On screen slide presentation • Print and plot without exiting program.

"The Twin has it all over 1-2-3 when it comes to graphics capabilities, offering both analysis and presentation quality graphics."

"The Twin adds a few features that big brother [Lotus] might be jealous of."

**—PC Magazine, August 1986**

"Anyone who uses release 1A of 1-2-3 would be completely at home working with Twin."

**—PC Week, May 6, 1986**

***Requires 320K RAM.***

**100% Satisfaction Guaranteed**

***Unprecedented! We Trust You!***

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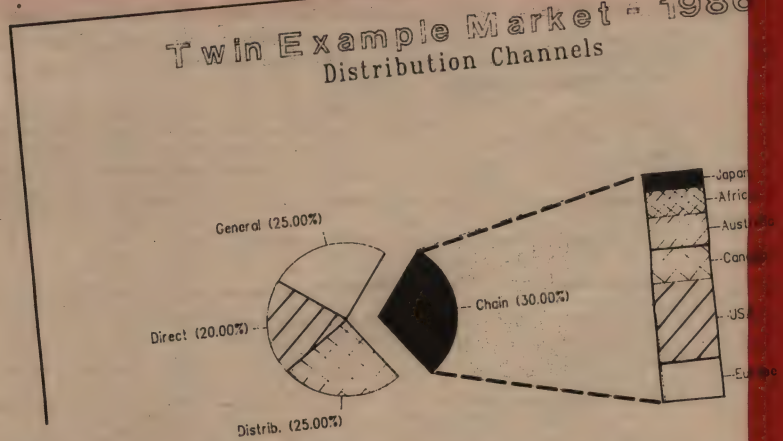


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## Leading Edge® Word Processor

### For IBM and All Compatible Systems

ONLY $29

**Lowest Prices Anywhere!**

Basic & Simple Version Mfr. Retail ~~$100.00~~ **$29**

With Spelling Checker and Merge/Print Options Mfr. Retail ~~$258.00~~ **$39**

"The Leading Edge Word Processor offers the best balance of user friendliness, performance and features of all the programs tested."
**Software Digest, January 1986.**

Software Digest is an independent publication which accepts no advertising. Other programs tested included WordPerfect, Volkswriter Deluxe, WordStar 2000 Plus and Microsoft World.

This program is a gem, and at $250, it's also a gem of a bargain.
—**PC Magazine, January 28, 1986**

**100% Satisfaction Guaranteed**

***Unprecedented! We Trust You!***

If you are not completely satisfied with this software after a 15 day trial, simply call us to return it for a complete refund.

SOFTWARE

- Adds or deletes characters
- Recalls deleted characters if you change your mind
- Automatically backs up your programs, even if you forget
- Makes two backup copies, not just one
- Splits screens for access to two documents at once
- Prints up to seven colors with compatible printers, including IBM, Epson, Diablo, C.Itoh, NEC, Qume, Star Micronics
- Underlines important words and phrases on screen
- Toll free support line plus on-line help
- Marks ends of pages where you want them
- Prints boldface, double wide, italics, underscores, superscripts, and subscripts
- Comes complete with training disk and reference manual
- Sets and resets margins and tabs
- Moves blocks of type
- Cut and paste capabilities
- Merges paragraphs
- Merge/Print supports dBase II files
- Centers words, lines and columns
- Text and Keystroke Macros
- Change between upper and lower case characters
- Time and date commands

### Ordering Information

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|---|---|---|---|
| LE999-C12 | Basic & Simple Word Processor | $29 | $5 |
| LE888-C12 | Word Processor with Spelling Checker and Merge/Print | $39 | $5 |

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*For Apple II, IIe and II+*

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91% OFF LIST

SOFTWARE

### WordStar

*Version 3.33*
The industry standard word processor!

### SpellStar

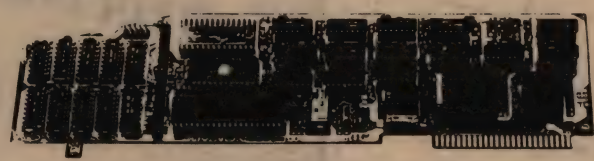
*Version 3.3*
Allows you to check spelling using 20,000 word dictionary.

### StarIndex

*Version 1.01*
Creates indices and tables of contents.

### MailMerge

*Version 3.3*
Creates mailing lists, merges files.



### Appli-Card CP/M Board

*Made by PCPI, also sold ad StarCard.*

Best on the market! Includes CP/M 2.2, Z80B processor, 6 MHz, 70 column display without an 80 column card (or 80 columns with an 80 column card).

Also Available...

**WordStar Professional**
*Includes WordStar, SpellStar, MailMerge, StarIndex.*
ONLY $49

**Appli-Card CP/M Board**
ONLY $49

**100% Satisfaction Guarantee**
One year warranty from MicroPro plus 15 day trial. If you are not satisfied with this software for any reason, simply call to return it within 15 days of receipt for a complete refund.

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| AP617-C12 | WordStar Professional | $49 | $8 |
| AP618-C12 | Appli-Card CP/M Board | $49 | $8 |

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## Brand Name Hayes Compatible Modems!

**1200 Baud**
**$99**
Comparable Price
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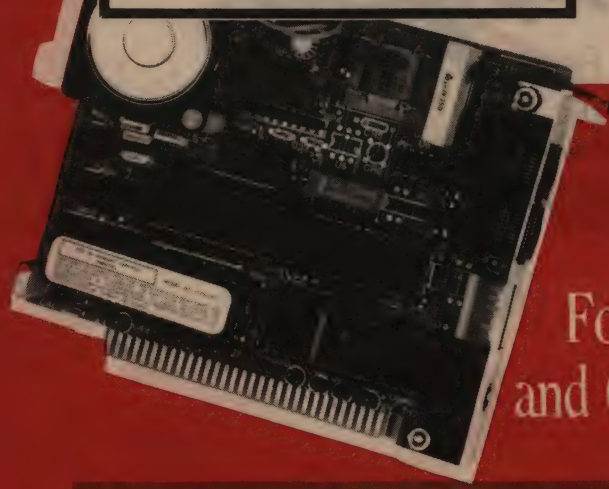
**ONLY $99**
1200 baud



**The Amazing Things**
**Model "A" Series**
Internal Modem

For IBM PC, XT, AT and Compatibles

**2400 Baud**
**$219**
Comparable Price
~~$739.00~~

MODEMS

***Runs SmartCom, Cross Talk, PC-Talk and Many More!***
***2 Year Warranty!***

- 300-1200 bps and 300-2400 bps Models Available
- Half Card Internal Modem
- Compatible with IBM PC, XT, AT and Compatibles
- Auto Dial/Auto Answer
- Asynchronous Data Transmission
- Dual Telephone Jacks
- BitCom Communications Software Included
- Full or Half Duplex
- Bell 212A/103A Compatible
- RJ11 Telephone Cord Included

**100% Satisfaction Guarantee**

2 year warranty from Amazing Things plus 15 day trial. If you are not satisfied with this modem for any reason, simply call to return it within 15 days of receipt for a complete refund.

**Ordering Information**

| Product # | Item | Price | Shipping |
|---|---|---|---|
| AM1200-C12 | Amazing Things 1200 Baud Modem | $99 | $5 |
| AM2400-C12 | Amazing Things 2400 Baud Modem | $219 | $5 |

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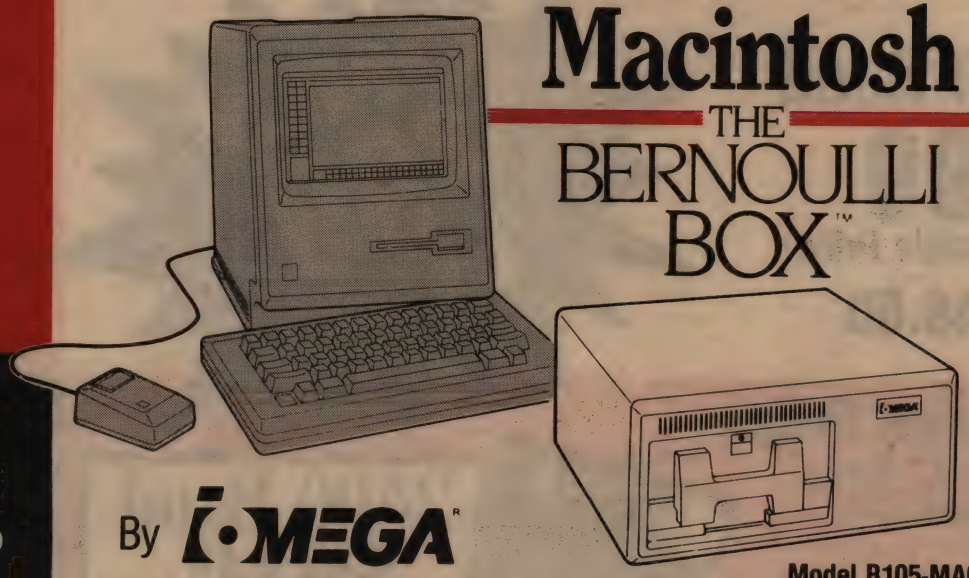

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**Liquidation Price**
**$499**

By IOMEGA®

Model B105-MAC

## Unlimited Storage Capacity!

### It's Like Having An Unlimited Supply of Removable 5 MB Hard Disks!

- Unlimited storage capacity (5 MB per Cartridge)
- More Resistant to Shock and Vibration Than Any Other Storage System, Fixed or Removable
- Use For Primary Storage, Backup Storage, Archival Storage or Software Loading
- Works With All Macintosh Models
- Plugs Directly Into The Macintosh Serial Port *(Printer Can Plug Into Bernoulli Box)*

**Note:** Special cabling is required for use with Mac Plus and ImageWriter II printer, and is available from your local Apple dealer. Ask our operator for details and part numbers.

**SPECIAL OFFER**

15 Meg Storage
Set of 3 5 MB Cartridges

**Only $99**

**Regularly $59 Each**

*Cartridges available only with purchase of Bernoulli Box.*

### Specifications

**Start/Stop Time:** 5/10 seconds
**Average Access Time:** 50 ms
**Capacity:** 5 MB per cartridge
**Size:** 5.1"(H) x 10.7"(W) x 12.5"(D)

**100% Satisfaction Guarantee**

Full 90 day manufacturer's warranty from IOMEGA plus 15 day trial. If you are not satisfied with this product for any reason, simply call to return it within 15 days of receipt for a full refund.

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|---|---|---|---|
| BB105-C12 | The Bernoulli Box for Macintosh | $499 | $19 |
| BB740-C12 | Set of 3 Bernoulli Box Cartridges | $99 | $7 |
| BB960-C12 | Single Bernoulli Box Cartridges | $59 | $7 |

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*Connect Your PC With Your Overhead Projector!*

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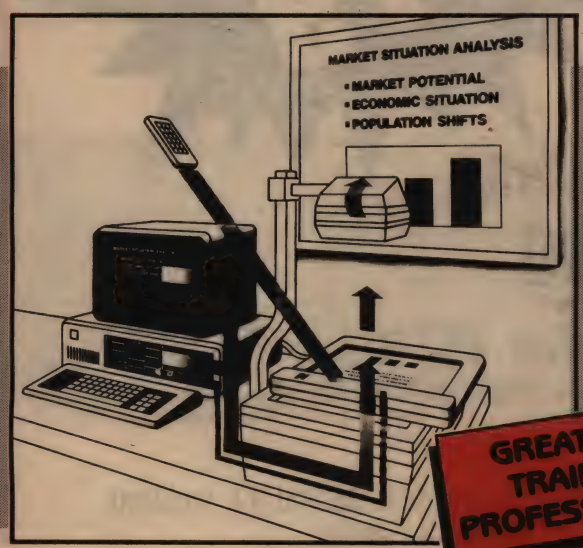



**The KODAK DATASHOW Projection System**

~~Comparable Price~~
~~$4250.00~~

*For IBM PC and Compatibles*

GREAT FOR TRAINING PROFESSIONALS

- Easily Transportable—Measures Only 12″ x 13″ x 2″, Weighs Only 4 Pounds
- High Resolution (640 x 200) LCD Image
- Plugs Directly Into Serial and CGA Ports
- Wireless Remote Control and Software Included

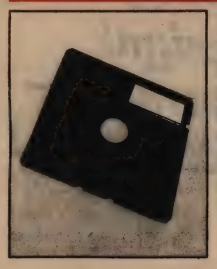
### LCD Projection Pad

The projection pad sits on the glass platen of an overhead projector and generates a crisp, clear on-screen display of dark blue images on a light grey background. Black, blue, red and magenta pixels on a color monitor are displayed as dark blue pixels on the projection pad. Green, cyan, brown and white pixels appear as light grey background.

### Remote Control

The 18-key wireless remote control lets you command the Datashow from virtually anywhere in the room. You can advance or reverse screens, access any screen stored in memory, highlight or point to any area of the screen, even invert the screen image or split the screen, all at the touch of a button!

### Datashow Software



The easy to learn menu driven software package included with the Datashow helps organize and monitor the presentation of finished screen images. Integrates with all popular spreadsheet, word processing, graphics and integrated packages without modification.

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# Apple II Disk Drive Liquidation!

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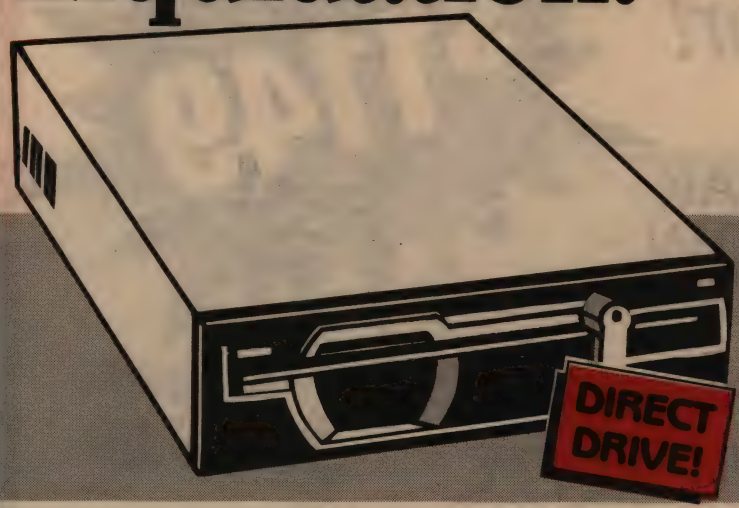


Comparable Price
~~$129.00~~

**The Bachelor FD103**
*Made by Asia Commercial Co.*

DISK DRIVES

- *Completely Apple Compatible!*
- *Quiet Direct Drive Motor!*
- *Plugs Directly Into Apple Disk Controller— No Modification Needed!*
- *Space Saving Trimline Half Height Design!*
- *1 Year Warranty— Serviceable In U.S.!*

- Cable For Apple II, IIe and II+ Included
- Flip Style Door Handle
- LED Indicator
- High Speed Data Access

## Specifications

**Disk Type:** 5¼" single sided floppy
**Storage Capacity:** 164K formatted
**Compatibility:** Apple II, IIe, II+ and compatibles
**Recording Density:** 5536 BPI
**Data Transfer Rate:** 250 KBPS
**Track to Track Time:** 6 msec
**Track Density:** 48 TPI
**Number of Tracks:** 40
**MTBF:** 10,000 hrs typical usage, 25% duty cycle
**Dimensions:** 146mm (W) x 41mm (H) x 210mm (D)
**Weight:** 1.45 kg

## Ordering Information

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| FD103-C12 | Apple II Disk Drive | $79 | $12 |

## 100% Satisfaction Guarantee

1 year manufacturer's warranty plus 15 day trial. If you are not satisfied with this disk drive for any reason, simply call to return it within 15 days of receipt for a complete refund.

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## TOSHIBA Floppy Drives

*For IBM PC's, XT's and Compatibles*

ONLY $79

These are the same high quality drives that Leading Edge uses in the Model "D" computer.

DISK DRIVES

### TOSHIBA FD 5445

- 5¼" Double Sided, Double Density
- 360K Formatted Capacity
- 48 TPI
- Direct Drive Brushless Motor
- Space Saving Half Height Design
- Low Power Consumption
- Beige Front Face Plate
- Works with Standard PC/XT Floppy Drive Controller

### 12 Drives

ONLY $69 EACH

We're offering a discount on quantity 12 purchases, since these drives come to us in cartons of 12. A great deal for corporations, user groups, dealers, etc.

*Save an extra $72 on shipping — only $3 each!*

**100% Satisfaction Guarantee**

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|---|---|---|---|
| TD360-C12 | Toshiba FD 5445 Floppy Drive | $79 | $8 |
| TD399-C12 | 12 Toshiba FD 5445 Floppy Drives | $828 | $24 |

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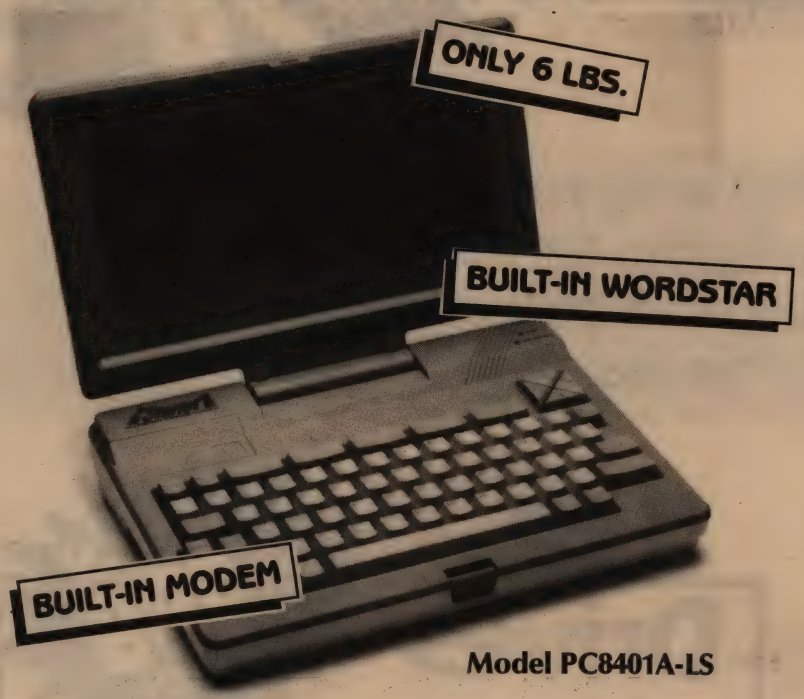
# BCE WordStar To Go!

## NEC Laptop Word Processor/Terminal

ONLY $399




**Model PC8401A-LS**

- Built-In WordStar, Spreadsheet and Database
- Internal 300 Baud Modem with Communications Software • Operates On Batteries or AC Power
- Backup Battery Stores Data in RAM Up To 40 Days • 64K RAM • Parallel and Serial Ports
- Complete Reference Manuals • Fits Into A Briefcase!

### Makes A Perfect Christmas Gift For...

***Students***—Use it in class to take notes, then bring it home to print them out.

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***Anyone*** who needs to work on the road!

**100% Satisfaction Guarantee**

90 day warranty from NEC plus 15 day trial. If you are not satisfied with this system for any reason, simply call to return it within 15 days of receipt for a complete refund.

**SPECIAL OFFER!** Get the ***NEC PC8401A-LS portable computer,*** the ***NEC PR105A Near Letter Quality Printer,*** and connecting cable, all for ***only*** **$539!**

See our ad for the NEC PR105 for complete details on the printer.

**Ordering Information**

| Product # | Item | Price | Shipping |
|---|---|---|---|
| NC840-C12 | NEC Laptop Word Processor/ Terminal | $399 | $12 |
| NC999-C12 | NEC Laptop Word Processor/ Terminal with PR105 Printer | $539 | $24 |

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ONLY $399

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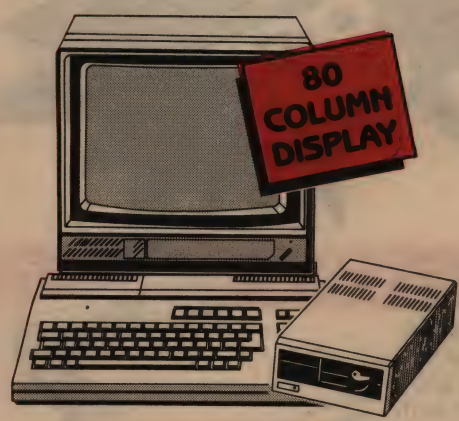


COMPUTER WITH MONITOR & DISK DRIVE

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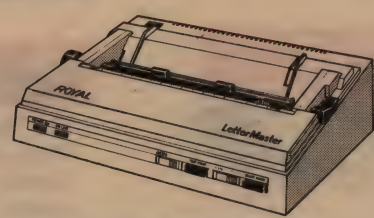


LETTER QUALITY PRINTER

+

FREE SOFTWARE

A Perfect Christmas Gift!

COMPUTERS

### ROYAL Alphatronic Computer

- CP/M Operating System—**Lets You Run Thousands of CP/M Programs**
- 64K RAM
- Z80A Processor
- Parallel and Serial Interfaces
- 12" Amber Composite Monitor—**Full 80 Column Display**
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### ROYAL Letter Master Printer

- Letter Quality
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- Underlining
- Parallel Interface
- 98 Character Pica Printwheel

### Peachtree Software

- Peachtext Word Processor
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- CP/M Menu
- Basic 80

PLUS *Full Documentation and All Necessary Cables*

### 100% Satisfaction Guarantee

90 day warranty from Royal plus 15 day trial. If you are not satisfied with this system for any reason, simply call to return it within 15 days of receipt for a complete refund.

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| RY64-C12 | Complete Royal Computer System | $399 | $25 |

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# Full Featured Home Telephone System with Intercom

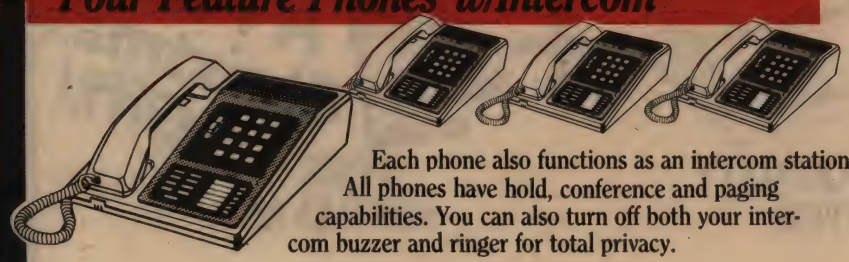
*You get all these features for less than the cost of 4 high quality telephones!*

**ALL FOR ONLY $299**

**79% OFF LIST**

TELEPHONES

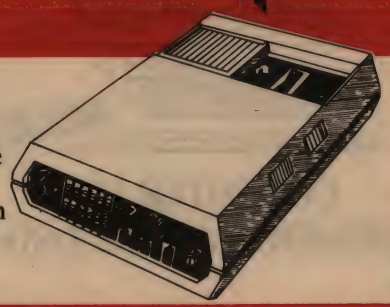
## *Four Feature Phones w/Intercom*



Each phone also functions as an intercom station. All phones have hold, conference and paging capabilities. You can also turn off both your intercom buzzer and ringer for total privacy.

## *Control Unit*

The "brains" of the system. Plugs directly into your incoming telephone line and controls all the phones in the system. The system can use the wiring already installed in your home.



## *Monitor Box*

Monitors activity in any room—a perfect "electronic babysitter." Also functions as an extra intercom station.

## *Door Chime Box/Intercom Unit*

Doorbell signals every phone in the system. You can carry on a conversation with visitors at your door.

## *A Telephone System from BCE?*

Why is BCE, a company known for selling quality computer equipment at incredible prices, offering a deluxe home telephone system to readers of Computer Shopper? It basically comes down to one thing—we know a bargain when we see one, and we think you will, too!

This entire system is priced far less than the cost of 4 quality telephones. This system includes those 4 telephones, each equipped with numerous features, plus a whole lot more. It operates on a single phone line and can use the wiring already installed in your home.

Each phone also functions as an intercom station. The room monitor unit lets you listen in on a room from any phone in the system, and the door chime/intercom unit lets you identify and talk with visitors before they enter your home.

This system was made by TIE Communications, a very highly respected telecommunications company. It complies with FCC regulations and is covered by our 15 day 100% satisfaction money back guarantee.

## *Complete Installation & Operation Instructions*

Detailed information on how to make the most of your new phone system.

**100% Satisfaction Guarantee**

100% satisfaction guaranteed 15 day trial. If you are not satisfied with this phone system for any reason, simply call to return it within 15 days of receipt for a complete refund.

**Ordering Information**

When ordering, please specify **Product #TP106-C12. Add $22 shipping and handling.**

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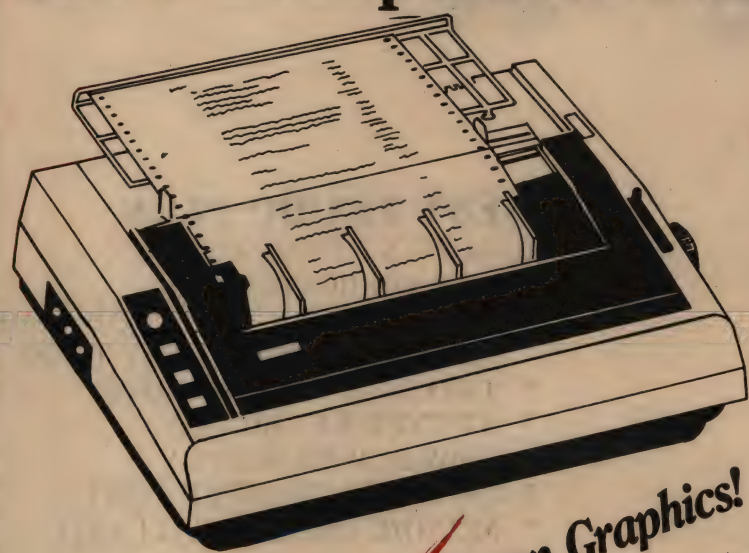
MATRIX PRINTERS

## Liquidation! IBM Compatible NLQ Printer

60% OFF LIST



Mfr. Retail ~~$425.00~~

**Liquidation Price $169**

**FACIT 4509** ✓ Epson Graphics! ✓ IBM Character set!

• 120 CPS Draft,30 CPS Near Letter Quality • Complete IBM Character Set • Epson RX80 Command Compatible • 60 Lines Per Minute Throughput • Complete Graphics Capabilities • Parallel Centronics Interface •

### Print Sample

```
The Near Letter Quality Mode of the
Facit 4509 printer is perfect for
business correspondence.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

The draft mode is great for high speed
printouts.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
```

### Specifications

**Printhead:** 9 wire printhead. **Character Matrix:** 9 x 9. **Character Set:** IBM/Epson compatible character set. Epson RX80 character set. **Character Height:** 1/10 inch. **Printing Method:** Bi-directional logic seeking. **Print Speed:** 120 CPS Draft, 30 CPS NLQ. **Throughput:** 60 full lines per minute at 10 CPI. **Character Spacing:** 10, 12, 17 CPI. **Line Length:** 80 columns at 10 CPI. **Print Modes:** Elongated, underlined, bold, vertical bold, italic, subscript, superscript. **Line Spacing:** 6 or 8 LPI. **Form Length:** Four formats switch selectable, or by software commands. **Vertical Format Commands:** Line feed, vertical tab, form feed, local line feeds. **Paper Width:** Minimum 4 inches (edge to edge), maximum 10 inches (edge to edge). **Paper Thickness:** Original plus 3 copies. **Paper Feed:** Built-in tractor **Ribbon Type:** Cassette with endless loop. **Ribbon Life:** 4 million characters. **Buffer:** 248 bytes. **Interface:** Parallel centronics. **Power:** 50 W (Printing). **Dimensions:** 16.6"(W) x 4.9"(H) x 13.4"(D). **Weight:** 20 lbs.

### Ordering Information

| Product # | Item | Price | Shipping |
|---|---|---|---|
| FA509-C12 | Facit 4509 NLQ Printer | $169 | $17 |
| CA200-C12 | IBM Parallel Cable | $19 | FREE SHIPPING WITH PRINTER ORDER |
| CA250-C12 | Centronics to Centronics Parallel Cable | $19 | |

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### BEST PC-XT (IBM PC-XT COMPATIBLE)

* 640K MEMOERY ON BOARD
* TWO 360K FLOPPY DRIVE DSDD W/CONTROLLER
* PARALLEL PORT
* MONO/G CARD OR COLOR/G CARD
* 150 W POWER SUPPLY
* AT TYPE KEYBOARD FOR XT

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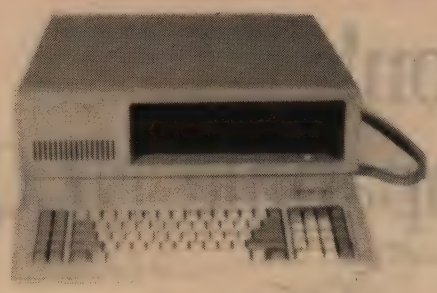

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* TWO 360K FLOPPY DRIVE
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* 150W POWER SUPPLY
* PARALLEL PRINTER PORT
* MONO/G OR COLOR/G CARD

**$1125**

### BEST PC-AT (IBM PC-AT COMPATIBLE)

* 512K MEMOERY (EXPENDABLE TO 1 MB)
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* SERIAL/PARALLEL INTERFACE CARD
* 200 W POWER SUPPLY
* KEYBOARD
* MONO/G OR COLOR CARD
* 20 MB SEAGATE 225 HARD DISK

ONLY **$749.00**

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* CITYZEN
* OKIDATA
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150W

| | |
|---|---|
| * MOUSE | $105.00 |
| * 150 W POWER SUPPLY | $ 85.00 |
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| * 20 MB HARD DISK SEAGATE 225 W/CONTROLLER | $450.00 |

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| | |
|---|---|
| * BEST TTL MONITOR | $110.00 |
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| * MITSUBISHI COLOR | $295.00 |

BEST TTL MONITOR

### (ONE YEAR WARRANTY)

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PC too

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- XT Chassis, 256K MB expandable to 640K
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- Floppy Disk Controller
- 360K Floppy Disk Drive
- IBM compatible with 8088 chip speed of 4.77 Mh
- 8 Expansion Slots
- Full 90 Day Warranty
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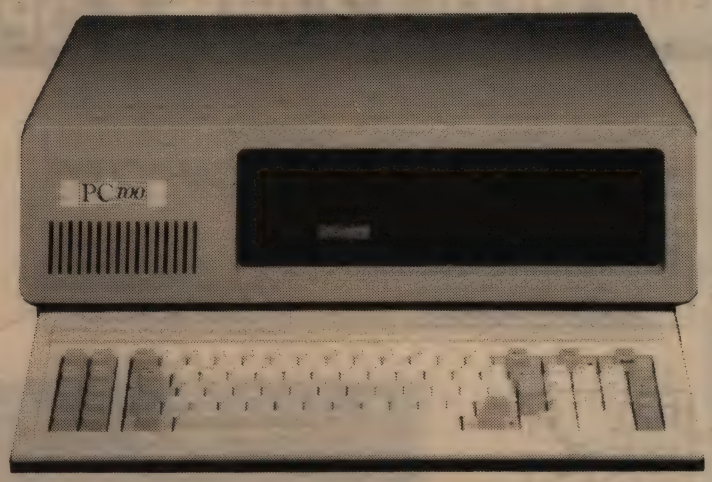


MONITOR OPTIONAL

**$539.00**

## OPTIONS AND ACCESSORIES

| | |
|---|---|
| Teac 55B Floppy Drive | $109.00 |
| 10 Meg Hard Disk and Controller | $379.00 |
| AT/XT Keyboard Upgrade | $24.99 |
| RGB Color Video Card w/Printer Port | $89.99 |
| Monochrome Graphics Video Card w/Printer Port | $89.99 |
| 640K Memory Upgrade | $79.99 |

**PARADISE**
Multidisplay Video Adapter
**$169.00**

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includes controller

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## HIGH SPEED 12 MHZ OPERATION SELECTABLE TO 6,8,10, and 12 MHZ!

- *FULL IBM PC-AT* COMPATIBILITY!*
- *FULL MEGA-BYTE RAM CAPACITY!*

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***100% DESIGNED, MANUFACTURED, ASSEMBLED AND TESTED IN USA!***

AIT Corporation is a publicly traded company. Majority USA owned and traded on the OTC market under AITC

Keyboard Interface same as PC-AT

**FULL TIME PRODUCT SUPPORT AND SERVICE.**

**UNIQUE FEATURE!** Hardware Reset Switch

***NEW!***

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**VOLUME DISCOUNTS AVAILABLE!**

**UNIQUE FEATURE!** Multi-Speed 80287 Numeric Processor Speed-Up Capability (Switch Selectable)

**UNIQUE FEATURE!** Complete Set-Up Software in ROM BIOS (No Disk Required for Set-Up)

***Triple Tested for 100% Quality Assurance!***

**Complete Documentation Package with Full Schematic Diagrams Included**

***Highest Quality Industrial Grade AMP Sockets!***

***ONLY!***

**$499.95**

***OEM EVALUATION BOARD*** Completely Assembled and Tested with all IC's and Components

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- ☐ ATTAK-386™ 32 BIT MICRO ..... CALL
- ☐ CASES, POWER SUPPLIES, PERIPHERALS, ETC. . CALL
- ☐ TURBO-SCOPE™ A/D BOARD ..... $99.95
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- **OK RAM**
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ALL ITEMS: WHILE SUPPLY LASTS!!

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| D3 | APPLE IIC COLOR MONITOR STAND | 18.95 |
| D4 | SHUGART M606 | 189.95 |
| D5 | SEARS PERSONAL ELECTRONIC PRINTER | 94.95 |
| D6 | HAYES SMARTMODEM 1200B | 249.95 |
| D7 | HP PRINTER STAND | 12.95 |
| D8 | APPLE IIC MONITOR | 59.95 |
| D9 | TOSHIBA TRACTOR FEED (3-IN-ONE) | 41.95 |
| D10 | PC 1200 ZOOM MODEM | 109.95 |
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| D12 | COMMODORE 64 COMPUTER | 79.95 |
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| D30 | KIMTRON DATA TERMINAL (KT-7 PC) | 219.95 |
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# Executive Systems Releases HOT

Executive Systems Inc. has announced the release of HOT, a new microcomputer utility that enables users to quickly create customized menus, completely bypass the complexities of DOS, and locate and edit any file in any drive, all in single keystroke operations.

The $75.00 software utility is the company's first new product release since the introduction of XTREE, which has become the accepted industry standard in hard disk and directory management.

HOT instantly puts the user in control of his PC by automatically setting up a series of menus from which all programs and files can be accessed at the touch of a single key.

With HOT, users are removed from the complex and repetitive commands required to run a computer's operating system and applications. Users can instantly choose any application program or DOS utility from a customized set of menus or menus they create. HOT provides artistic options for creating menus with style.

Unlike other menuing programs, HOT is actually composed of eight powerful utilities combined into one versatile software package. These utilities include: 1Word, a popup text editor; File Finder, a popup file and directory locator; HotMenus, an easy to use menuing system; Popup HotMenus, a menu driven keyboard macro program similar to Superkey; HOT-Build, an intelligent automatic menu maker; HOTime Calendar, a popup monthly calendar; and Command Shell, a DOS-like command line with system statistics and command history.

The program features HOTHelp, context sensitive help for all HOT functions; and HOTutor, an on-line tutorial that quickly shows users how to use HOT like a PC pro.

In addition, all DOS utilities are presented in clean, easy-to-use menus, eliminating the need to remember dozens of lenghty commands like DISKCOPY, FORMAT, CHKDSK, BACKUP, RESTORE, etc.

### HOT Benefits

HOT will improve any PC user's performance in four distinct ways. HOT (1) eliminates complex commands required to start any program; (2) reduces lengthy keystrokes after a program is running; (3) reduces entry errors, and (4) allows uses to spend more time using their system instead of fighting it.

HOT requires an IBM PC/XT/AT or compatible computer with 256K of memory, and MS-DOS 2.0 or PC-DOS, although 512K and DOS 3.0 are recommended. HOT retails for $75.00 and is not copy protected.

For additional information contact Executive Systems Inc., 15300 Ventura Blvd., Suite 305, Sherman Oaks, California 91403; or call (818) 990-3457.

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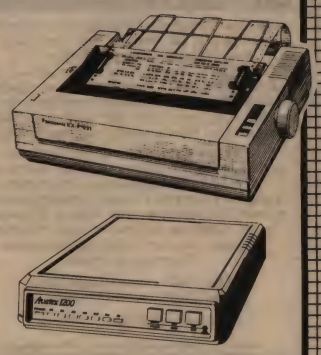

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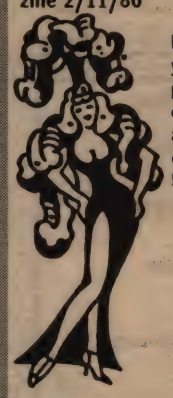

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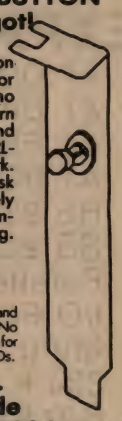

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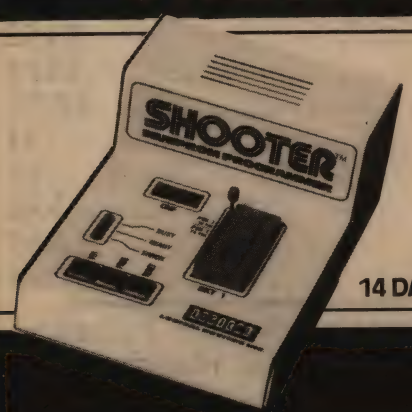


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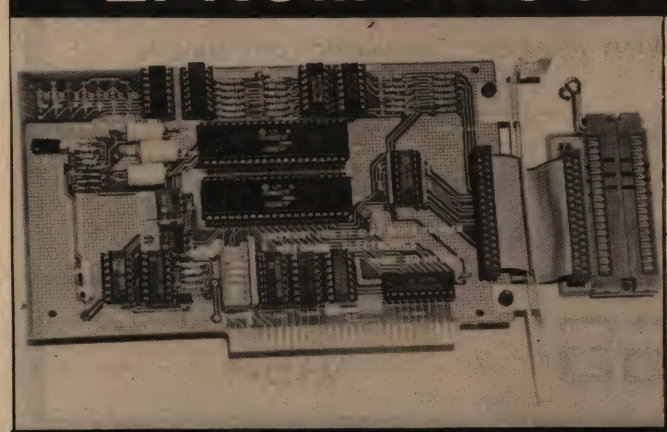

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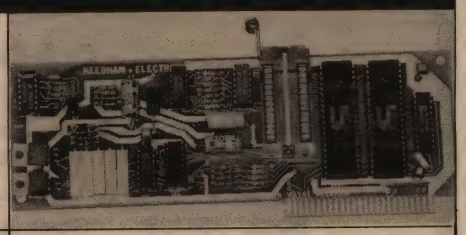

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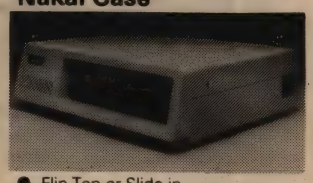

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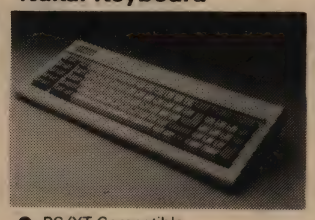

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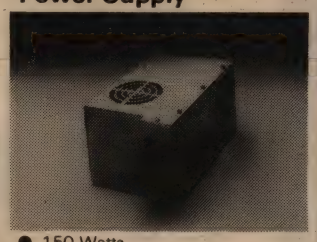

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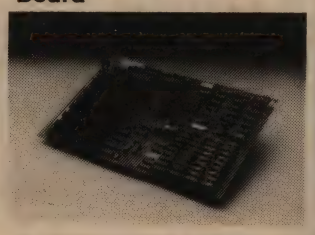

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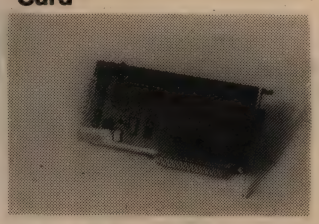

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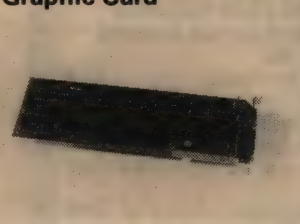

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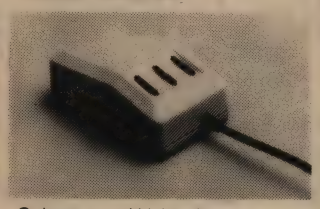

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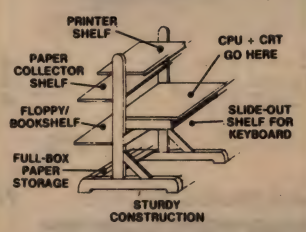


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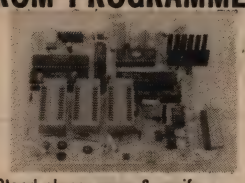

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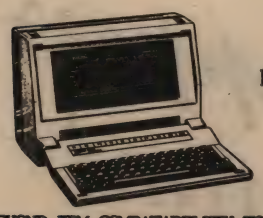

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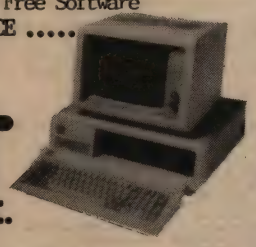

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RICHMOND, VIRGINIA 23231
804-795-1114

Someone you know needs a bear.
COME TO MORROW TODAY!

---

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- Normal use of DOS commands and Application Software.
- IBM PC, XT, AT or true compatible hard disk system running DOS V2.0 and higher.
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| | |
|---|---|
| Apple II Drives | $30 |
| Shugart SA800/801 | $25 |
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60 day warranty. Quick turnaround and trade-in available for drives too costly to repair. Prices do not incl. parts or shipping. If parts more than $20 we get permission before repairing. Units returned UPS COD unless otherwise requested.

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(305)747-7384
See classified section
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---

Premium Quality by DATATRONICS
**MODEMS**
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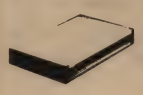

- Fully Hayes® compatible
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- Solid extruded aluminum housing
- 30 day money back guarantee
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| | | |
|---|---|---|
| 1200B Internal: | Regular $479 | SALE $239 |
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Call for pricing on add-on cards, cables, monitors, and more.

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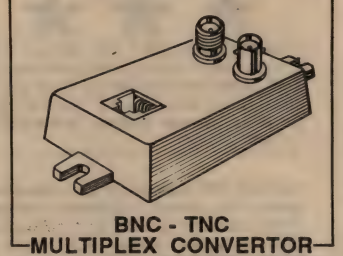
# L-COM® Shopper's Guide

**Products for the ELECTRONIC & COMPUTER Industry**

*new low price*

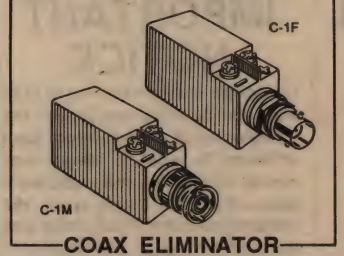


## BNC - TNC MULTIPLEX CONVERTOR

Simplify WANG WORK STATION wiring from troublesome dual coax to a twisted pair telephone wires. Reliable communication between host and terminal up to 600' (42xx) or 900' (22xx). Functions are completely transparent, allowing host and terminal to communicate exactly as they would over dual coaxial cables with no degradation in service or performance. Convertors are maintenance free. Two required, one on each end, BNC & TNC to RJ-11. Price Each.

| MODEL | 1-9 | 10-24 | 25-99 |
|---|---|---|---|
| C-2BT | 48.50 | 45.59 | 42.68 |

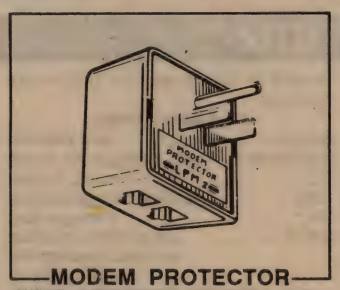
*new low price*




## COAX ELIMINATOR

These COAXIAL BALUNS act as coaxial eliminators when used in pairs and allow IBM 3270 terminals to be connected over one twisted telephone pair to the IBM 3274 controller. Accepts both RJ11 (Jack) and twisted pair (screws). Transmit data up to 1000 ft. without any signal degradation or change in response time. Simple to install, saves time, and provides a total cost saving that more than offsets the initial cost.

| MODEL | BNC | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| C-1F | Female | 24.50 | 23.03 | 21.56 |
| C-1M | Male | 24.50 | 23.03 | 21.56 |

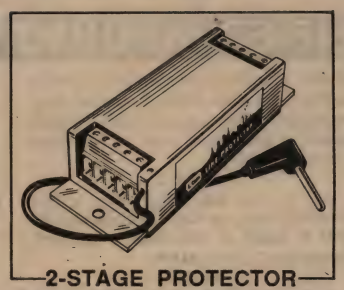


## MODEM PROTECTOR

SURGE SUPPRESSOR PROTECTS against lightning and other electrical disturbances. Our 2-stage design provides a sophisticated blend of high speed, gas discharge and voltage limiting in nano seconds. Proper ground is most important & L-com has solved this by making use of your grounded AC outlet. The protector recovers automatically in preparation for next surge.

| MODEL | CLAMP | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| LPM-2 | *25V | 33.00 | 29.70 | 26.40 |
| LPM-3 | **170V | 34.50 | 31.05 | 27.60 |

*Dedicated Communication Systems
**Ring Up System



## 2-STAGE PROTECTOR

Protects four data lines from lightning. Advanced design has MOVs to handle avalanche of high surge currents and Bi-polar TransZorbs for voltage limiting. Supplied with ground cable which plugs into an AC outlet. LPU-32C has 2-line (Ring Up) protection.

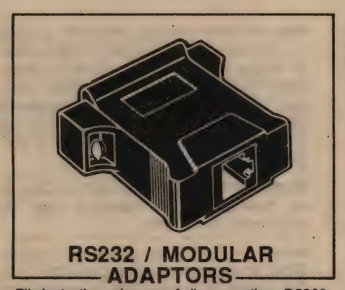
| MODEL | PROTECTION | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| LPU-34A | RS422 (6.8V) | 78.00 | 70.20 | 62.40 |
| LPU-34B | RS232 (26V) | 78.00 | 70.20 | 62.40 |
| LPU-32C | Modem (175V) | 64.00 | 57.60 | 51.20 |

Note: A wide variety of protection devices are offered by L-COM including custom designs.

## RS232 PROTECTORS

SURGE PROTECTORS guard against voltage spikes entering your RS232 ports. MOVs on crucial lines clamp electrical surges above 26V without affecting operation. Mounts in series, and all lines are wired thru. Surges clamp to pin 1. All metal case construction.

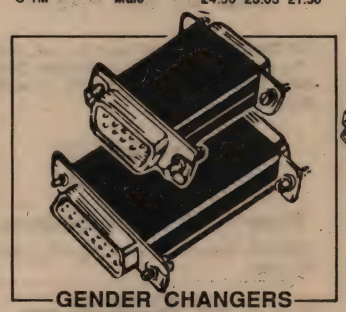
| MODEL | LINES | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| DSPS-3 | 2, 3, 7 | 24.95 | 22.70 | 19.96 |
| DSPS-4 | 2, 3, 7, 20 | 26.95 | 24.52 | 21.56 |
| DSPS-5 | 2, 3, 4, 5, 7 | 28.95 | 26.34 | 23.16 |
| DSPS-5B | 2, 3, 4, 7, 20 | 28.95 | 26.34 | 23.16 |
| DSPS-6 | 2, 3, 4, 5, 7, 20 | 30.95 | 28.16 | 24.76 |
| DSPS-8 | 2, 3, 4, 5, 6, 8, 20 | 34.95 | 31.80 | 27.96 |



## RS232 / MODULAR ADAPTORS

Eliminate the nuisance of disconnecting RS232 cables ever again.Now, the adaptor stays put and to disconnect simply unsnap the modular jack, same as you would an ordinary telephone. These simple adaptors fill most applications. Prewired lines are: 2, 3, 4, 6, 7 & 20. Your choice of male or female RS232, to mate with your equipment.

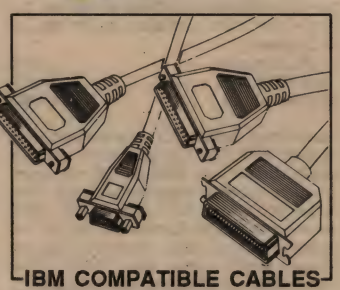
| MODEL | GENDER | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| RA-6F | Female | 7.85 | 6.91 | 6.12 |
| RA-6M | Male | 7.85 | 6.91 | 6.12 |



## GENDER CHANGERS

GENDER CHANGERS mate non-mating cables. Heavy duty insulated metal enclosure to stand wear and tear. Your choice of 9, 15, 25, 37 &-50 pin D-Sub connections. Model number provides for gender choice. All in stock for immediate delivery.

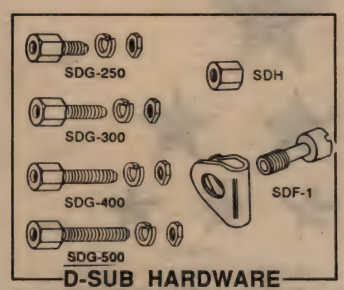
| MODEL | (*) Specify Gender | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| MG-9(*) | M-M or F-F | 15.95 | 14.51 | 12.76 |
| MG-15(*) | M-M or F-F | 18.95 | 17.24 | 15.16 |
| MG-25(*) | M-M or F-F | 23.95 | 21.79 | 19.16 |
| MG-37(*) | M-M or F-F | 27.95 | 25.43 | 22.36 |
| MG-50(*) | M-M or F-F | 29.95 | 27.25 | 23.96 |



## IBM COMPATIBLE CABLES

Finest IBM compatible cables you can buy with molded ends and fully shielded to minimize EMI and noise. CMX types mate IBM to Centronics compatible printer. CMZ has a 9 pin D-Sub to 25 Pin D-Sub for printer, plotter, mouse, modem, etc.

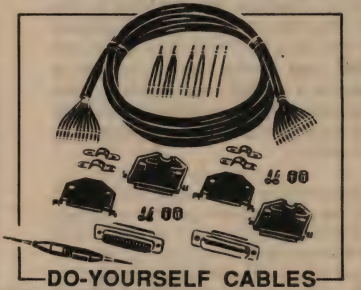
| MODEL/FT. | 1-4 | 5-9 | 10-24 |
|---|---|---|---|
| CMX-6 | 20.97 | 19.92 | 18.87 |
| CMX-12 | 23.97 | 22.77 | 21.57 |
| CMZ-6 | 16.17 | 15.36 | 14.55 |




## D-SUB HARDWARE

Standard 4-40 HARDWARE mates with all D-Subs. Sold only and priced in packs and multiples of 50. SDG thread lengths of .25 to .5".

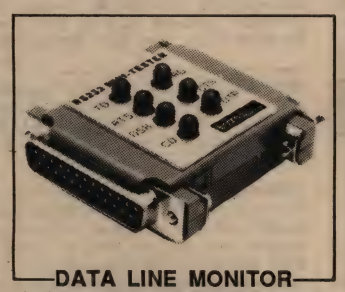
| MODEL/LGT | DESC. | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| SDG-250 | Jack Screw | 8.45 | 8.03 | 7.44 |
| SDG-300 | Jack Screw | 8.95 | 8.50 | 7.88 |
| SDG-400 | Jack Screw | 9.45 | 8.98 | 8.32 |
| SDG-500 | Jack Screw | 9.95 | 9.45 | 8.76 |
| SDH | Standoff | 5.45 | 5.18 | 4.80 |
| SDF-1 | Screw and Retainer | 9.45 | 8.98 | 8.32 |



## DO-YOURSELF CABLES

RS-232 CABLE KITS allow you to create your own Serial data cable. 12 conductor cable terminates to gold plated pins; simply insert into appropriate holes with tool provided. Everything you need is supplied. Please specify gender when ordering. (*) M-M or M-F.

| MODEL-FT | (*)Specify | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| CK25(*)-5 | M-M or M-F | 13.95 | 13.25 | 12.56 |
| CK25(*)-10 | M-M or M-F | 15.95 | 15.15 | 14.36 |
| CK25(*)-15 | M-M or M-F | 17.95 | 17.05 | 16.16 |
| CK25(*)-25 | M-M or M-F | 21.95 | 20.85 | 19.76 |



## DATA LINE MONITOR

A miniature DATA LINE MONITOR allows the user to determine the status of the seven key signals of the RS-232 data path. All 25 pins wired through, and dedicated Red LEDs report the status of:

- Transmit Data (TD) pin 2
- Receive Data (RD) pin 3
- Request to Send (RTS) pin 4
- Clear to Send (CTS) pin 5
- Data Set Ready (DSR) pin 6
- Data Carrier Detect (DCD) pin 8
- Data Terminal Ready (DTR) pin 20

| MODEL | CASE MAT'L | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| DLM | Plastic | 29.95 | 27.25 | 23.96 |
| DLMS | Metal | 32.95 | 29.98 | 26.36 |

## MINI BREAKOUT BOX

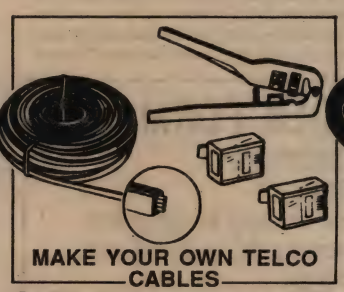
DATA TEST ADAPTOR aids in the design of new interfaces such as printers and terminals. Now it's easy to configure cable connections or signal paths. All 25 pins of each D-Sub connector terminate to individual patch jacks to allow inter-wiring in any pattern. Complete with 25 jumper wires. Metal construction. All pins are identified on label.

| MODEL | GENDER | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| DTAS | M-F | 29.95 | 27.25 | 23.96 |

## POPULAR COAX CABLES

Finest COAXIAL CABLES. Each has two male BNC connectors with molded strain reliefs. Only most popular lengths are shown, but in stock up to 100 ft. Be sure to specify (*) cable type; RG58C, 59B or 62A.

| MODEL/FT. | | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| CC(*)-0.5 | (*) Specify RG Type | 3.45 | 3.14 | 2.97 |
| CC(*)-1 | | 3.65 | 3.32 | 3.14 |
| CC(*)-2.5 | | 4.05 | 3.69 | 3.48 |
| CC(*)-5 | | 4.75 | 4.32 | 4.09 |
| CC(*)-10 | | 6.25 | 5.69 | 5.38 |



## MAKE YOUR OWN TELCO CABLES

Everything you need to assemble your own 4 or 6 wire modular cables. Modular plugs with gold contacts, flat cable in 100 ft. rolls and crimping tools of your choice. Other Telco products and accessories also available.

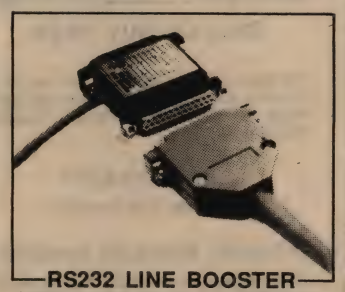
| MODEL | DESC. | QTY/PKG. | 1-9 | 10-24 |
|---|---|---|---|---|
| TD6P4C | 4-Plug | 100 | 25.50 | 22.44 |
| TD6P6C | 6-Plug | 100 | 38.00 | 33.44 |
| TDB4-100 | 4-Wire | 100 Ft. | 6.50 | 5.72 |
| TDB6-100 | 6-Wire | 100 Ft. | 12.50 | 11.00 |
| TDH522C | 4-Tool | One | 6.95 | 6.12 |
| TDH522D | 6-Tool | One | 7.95 | 7.00 |

*L-com First*

## OUR BEST TWINAX CABLES

L-COM is first to offer TWINAX CABLES with molded terminations on each end for exceptional life and better flexibility. Longer lengths are also available.

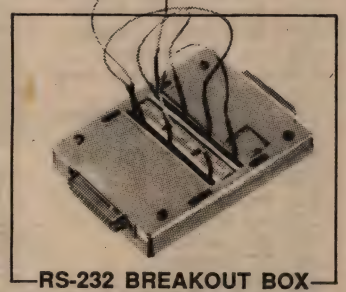
| MODEL/FT. | 1-9 | 10-24 | 25-99 |
|---|---|---|---|
| CCTXM-1.5 | 32.75 | 29.80 | 28.17 |
| CCTXM-3 | 33.50 | 30.49 | 28.81 |
| CCTXM-5 | 34.50 | 31.40 | 29.67 |
| CCTXM-7.5 | 35.75 | 32.53 | 30.75 |
| CCTXM-10 | 36.95 | 33.62 | 31.78 |



## RS232 LINE BOOSTER

Doubles operating distance of EIA lines. Booster receives signal, strengthens, filters out noise, converts electrical characteristics and then retransmits. Usable to 19.2K baud, both syncronous and asynchronous modes. 7 lines amplified are: 2 thru 6, 8 and 20. Includes a spare amplifier to wire as needed. Supplied with 115VAC supply.

| MODEL | 1-9 | 10-24 |
|---|---|---|
| DG-013 | 84.95 | 77.30 |



## RS-232 BREAKOUT BOX

An economical BREAKOUT BOX allows easy configuration of the RS-232 interface. Each line of the interface, with the exception of pin 1 can be programmed by 24 independent slide switches. 24 test points also provided on each side of the program switches to allow patching and monitoring. Supplied with 10 jumper cables and carry case. Rugged steel construction.

| MODEL | GENDER | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| RS-50 | M-F | 59.95 | 54.55 | 47.96 |

## RS232 ACTIVITY TESTER

A self-contained MONITOR & TESTER for all I/O conditions. Features: 24 switches and jacks to program and patch; twelve 2-color LEDs read lines, 2 thru 6, 8, 15, 17, 20, 21 & 25; one spare LED for patching and one more LED is dedicated as a pulse trap to monitor Hi-Speed signals. Supplied with two 9V batteries.

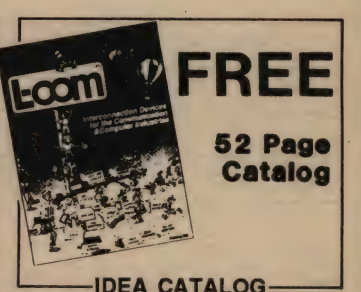
| MODEL | 1-9 | 10-24 |
|---|---|---|
| DG-005 | 189.95 | 172.85 |

*L-com First*

## IEEE-488 BULKHEAD ADAPTOR

L-COM is first to offer this GPIB FEED-THRU ADAPTOR which allows the IEEE-488 cables to pass through a panel. All metal construction with Male/Female connections. We also have a complete line of GPIB cables and many other accessories, all available from stock. Ask for details.

| MODEL | GENDER | 1-9 | 10-24 | 25-99 |
|---|---|---|---|---|
| CIB24-BA | M-F | 22.52 | 21.38 | 20.25 |




**FREE**

**52 Page Catalog**

## IDEA CATALOG

Over 1700 COMPUTER ACCESSORY products, many are unique to help solve data communication problems. A convenient shoppers guide which provides technical information, comparisons and quantity pricing. Includes coaxial & multi wire data cables, connectors, IEEE-488 products, switch boxes, patch panels, wall plates, testers, baluns, surge protectors, etc. Same day shipping of almost every item listed. Call Customer Service today at (617) 682-6936 for your FREE personal copy.

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**L-COM® DATA PRODUCTS 1755 Osgood St., No. Andover, MA 01845**

**Placing Orders ONLY**
**800-343-1455**

# CLASSIFIED

## CLASSIFIED INFORMATION

The classifieds are for **Pre-Owned Items & Software ONLY.** New equipment, Services, etc. must use regular Display space.

**Instructions**

In order for us to keep the ad rate low and insure accuracy, it is necessary that the following procedures are followed.
1. Type or print your ad legibly on a plain sheet of paper. Ads received that are difficult to read will be returned.
2. Write the desired category at the top of each ad. Please refer to the index, this page, if a category is not indicated, ad will be placed in the Miscellaneous section.
3. If more than one ad is submitted, use a separate piece of paper for each ad, making sure your complete name and address is at the bottom of each ad.

**CLOSING DATE** — 2nd Monday of the month. Example: Ads received by the 2nd Monday of December will appear in the January issue. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

**RATES**

**Subscribers:** 25 cents per word. $5.00 per ad minimum charge. The first two words (if underlined) will be set in bold face at no additional charge. Bold face or all cap words thereafter will be fifty (50) cents per word. Special bold headings, partial lines, open space or leader dots are:
1 line of leader dots with price, $1.25 per line
6.5 point line, $1.25
10 point bold line, $2.00
Maximum of 15 characters per line
**Non-subscriber rates are double all rates listed above.**

**REPEAT ADS**

Ads running more than one time. A repeat ad will be coded at the end of the ad with month the ad started and issue ad ends. Example: 8-160. Ad started Aug. ends 160 issue or January. NOTE: Please check to make sure your ad has been correctly coded.

**PROOFS**

Due to low classified rates a free checking copy or tear sheet cannot be sent if proof of insertion is desired, please send $3.00 extra.

**PHOTOS**

A photo will draw attention to your ad. Photos are $7.00 per column inch. Please send in B/W photos, preferable 4x5's cropped horizontally. Include your name and address on the back of each photo. If photo looks like it is more than one inch send in money for two inches or more.

★ $5.00
★★ $4.00
★★★ $3.00

**STARS**

Have a special piece of equipment to sell? Reducing the price of an item and want to attract attention to that fact? Take advantage of our low price "star" attention getters.

It's a fact...unusual "artwork" in or above an ad draws attention to that ad and the reader retains interest in that product longer.

*Get Response Quicker* with "Stars" above your ad. Above is the rate for different sizes. Just mark "stars" and the price of the one you choose above your ad copy and we'll take care of the rest. Be sure to include the cost with your ad payment.

**CS-ABREVIATIONS**

add-post ..... add postage
add-post-AP ... add postage, all prices
FC ..... Freight Collect
MBG ..... money back guarantee
PP ..... postage paid
SASE ..... send self-addressed stamped evelope for check return or information requested
10 DRP ..... 10 day return privilege
CCR ..... check clearance required

### EXAMPLES OF STYLES:

**Normal**

**PDP 11/03 COMPUTER**
Complete **OPERATING SYSTEM** with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at:
11/03 Computer ..... $900
Dual RZ-1 disc ..... $1,000
32KB memory ..... $2,800

**PDP 11/03 COMPUTER.** Complete operating system with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000 or separate at: 11/03 Computer $900, Dual RX-1 disk $1,000. 32KB memory $2,800. VT-52 video $1,500, GE Terminet 30 printer $800. Intertube video terminal $400. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

**10 Point Centered Head**

**PDP 11/03 COMPUTER**

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. **Joe Doe,** POB 1234, Somewhere, USA 00000, 123-456-7890.

**Leader Dots**

**Intertube** video terminal ..... $400 **Joe Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

## CLASSIFIED ORDER FORM

**Classified Dept., COMPUTER SHOPPER**
**P.O. Box F, Titusville, FL 32781**

To figure cost of ad, the rate is 25 cents per word for subscribers and 50 cents per word for non-subscribers (50 cents per word bold face) $5.00 per ad minimum charge.

Run under heading # _____
See Index This Page
(Please type or print)

**INCLUDE 25-CENTS PER WORD FOR YOUR NAME AND ADDRESS**

Name _____
Address _____
City _____
State _____ Zip _____

**INCLUDE 25 CENTS PER WORD FOR YOUR NAME AND ADDRESS FOR SUBSCRIBERS AND 50 CENTS PER WORD FOR NON-SUBSCRIBERS.**

(For additional words, use separate sheet of paper)

**Remittance for $_____ is enclosed.**
**You may run my ad _____ issues.**

## CLASSIFICATION NUMBER AND CATEGORY


**COMPUTERS (Large)**
(133) Burroughs Systems ..... 375
(136) Data General Systems ..... 375
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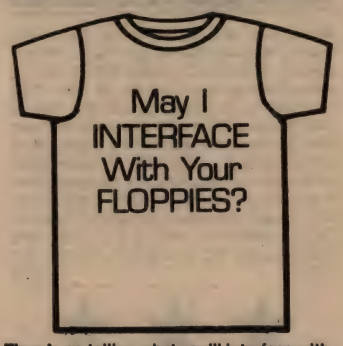


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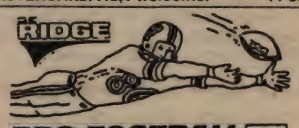


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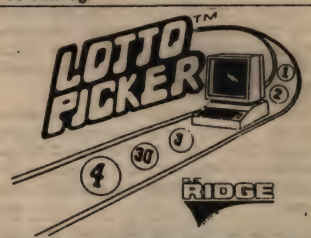


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R/D TECHNICAL NEWSLETTER: $14 US per year for projects, news, programs now featuring Bill Gronos. **Extended Basic II plus** module $75; **GPL ASSEMBLER** package w/Intern $78; **INTERN** TI operating system book $17.95; **GRAM CARD** 128k -downloads ALL modules to disk and MORE: for PE Box $250; **TI Basic Compiler $30.** Add 3% Visa & Mastercard. Add 3% SH + I. ALL PRICES IN US FUNDS. Call or Write **RYTE DATA**, 210 Mountain Street, Haliburton, Ontario Canada K0M 1S0 **705-457-2774.** 8-84

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**Original TI** recorders $24.95; Joysticks $9.95; some miscellaneous items SASE/Call. S&H $1.95/rec, -$.95/joy, $1.90/COD. **Mike An,** 4001 Stoconga Dr., Beltsville, MD 20705. **301-937-5876** after 5pm. 9-84

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**TI-99/4A New** Software "Basic Letter" features printing of letters and envelopes in personal letter format, editing, and form letters. No expansion necessary. Available in disk or cassette for $12 from **Micro-Biz Hawaii,** Dept CS, 98-1409 D. Kaahumanu St. Aiea, HI 96701. **808-488-9491.** 11-84

**TI99/4A Original Software:** games, education, bridge, finance, calendar, music. None over $5. SASE for description. **Down Home Computercraft,** Box 514-CS, Grand Island, FL 32735.

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**TI99/4A Software for Smith-Corona Fastext 80 Printer** ..... A Series of printer control utility, education, and stand-alone software. (All programs require XB, disk, 32k). For beginners—booklist "What You Were Never Told About Controlling Your Printer From The TI99/4A", contains lots of examples and explanations $9.95 + $1 (s+h); "Printerf" program demonstrates text & graphics modes $19.95 + $1.95 (s+h). For catalog or order **McKechnie, PO Box 2784, Fairfax, VA 22031.**

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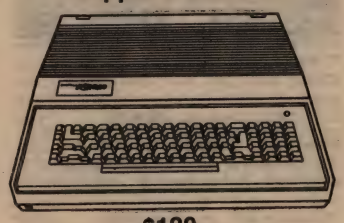

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**CHEEP!**

Mucho Apple Software!!! Too numerous to mention here. Mostly business, some games, all Toooo cheap (Example: Appleworks $100, PFS File $25, Hitchhikers Guide to Galaxy $15) Are We Crazy Or What!! Call or write for list. **Shreve Systems,** 845 Lark Ave., Shreveport, LA 71105. **318-865-6743** 4—9pm CST. 12-84

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**We buy** and sell Apple IIE's, DEC Rainbow's, IBM PC's, XT's, AT's etc. **Micro Resales,** 130 West Main, Urbana, IL 61801. **217-367-3621.** 11-87

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**CASINO GAMES** (#046) Casino games and more for the gambler in you.
**SPACE WAR** (#048) Climb aboard your Space Ship and get ready for some intergalactic fun. High space adventure and Bingo for Grandma, etc.
**MUCHO GAMES** (#049) Bingo for Mom, Death Star for Junior, and perhaps the Cryptogram Challenge for yourself. Good assortment of games, even Sub Command.
**GAME CRASH** (#050) World War and Battle start you off fast. Then when the kids comes in switch to Name or Spell the States. Good mix of education and fantasy.
**MINI MIX** (#051) Play cards or fight a war. You can even land on the moon or play Russian Roulette with these, and more.

### GRAPHIC

**GRAPH DODGE** (#109) Many great programs involving graphics. Also, Sound and 3D shapes, even Loan Amort. Too much more to list.

### INFORMATION

**HELP PLEASE** (#102) Apple help. This is a Tutorial that's useful if you don't know very much about your Apple or you've forgotten.

### MATHEMATICS

**PROFESSOR MATH I** (#059) The first disk packed full of math/statistic formulas. Go from Metric conversion, Differential EQ (and Solver) to Fourier, Statistic (STD. DEV., etc) and more.
**TYRANT TUTOR** (#060) Math Drills, Addition and Division, Flash Cards, even a Coin Tosser.
**PROFESSOR MATH II** (#061) More super math involving Binomial Dist., Chi Square, Coordinate Plots, Geometric Regres., and more, and more, and more.
**COMPUMATH** (#062) More on Equations, Group Averages, etc., even has a Coin Tosser and Addition Quiz.
**PROFESSOR MATH III** (#063) More super high order math-help. Averages, Compound Interest, Fourier Xforms, Hyperbolas, Metric Kelvin, Polar and much more. Includes a few math type games.

### MIXTURE

**MONSTER MIX I** (#058) Clock Card and other type of Hello's. Also Billboards, Catalog, and Menus.
**MONSTER MIX II** (#097) More catalog, menu and hello stuff. Worth the time to look through it.
**TIME BURNER** (#069) Mixture of programs (too varied to list all) but something for everyone. Weather Forecaster, Mind Reader, Vowel Finder, Elect. Cost, Baby Names and more.
**MIX UP** (#070) Perpetual Calendar, Decision Maker, IQ Test, Stop Watch and more.
**CRAM JAM** (#071) Calendar, Decision Maker III, Dirty Tricks and Random Insults (for your lawyer or insurance salesman) plus more.
**TIME OUT** (#072) From a Computer Analyst to the Life system. Even a Photo Color and Filter Quiz.
**ARRAYS** (#116) Opcodes, Voiceprint, Fraction and Drills. Can you sleep and know you don't have this disk?
**SAM'S PAK III** (#110) A good mixture of games, utilities (useful and great). Includes Fastboot, Laplace Inversion, Morse code, and so on.
**THE MIX-R** (#115) A good mix of useful programs. Hires Dumps, Tricolor Graphics, Checkbook Balancer, Poker and more. Yes, we even include a Parabolic Calculator program FREE.
**MIX UP** (#123) What a mix of programs. The cook can use the Cooking parts and the kids can learn Spelling and Math while you sleep.

### MUSIC

**MUSIC MAN** (#064) Apple music. Many good times plus a Music Writer and more. Will aid everyone who wants to add sound to their programs.
**MUSIC MAN II** (#065) Tunes and more on the Music Writer. Also Sound Effects and games.
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### PROGRAMMING

**BASIC BEGINNINGS** (#001) Basic programming to Integer. Also a simulation showing the 6502 CPU and etc. Even includes a Disassembler.
**APPLE CORE** (#002) More basic Apples. Good programming help and DOS system instructions.
**RUN WHAT?** (#003) More Basic but a must for the beginner. Shows some good programming style if you list programs.

### UTILITY

**SUPER UTILITY I** (#076) Base Conversion, Capture, Dump a SCII Mem., Free Sectors, Music Keys, Renumber, and so on. The Phone Dialer is good too.
**SUPER UTILITY II** (#077) More and more help. Edit a file, Decode Characters, Dump Pages, Sort everything and more.
**SUPER UTILITY III** (#078) File Handlers, Mem Tests, Text File Mixtures, Sector Recover, and VTOC Reconstruct, to name just a few
**SUPER UTILITY IV** (#079) Start with Audio Number (a real time saver), do BSTATS, Disk Help, a Lister, Catalogs, and Verify are just a few of these.
**SUPER UTILITY V** (#080) Good Disassembler, Applewriter To Text, Move Mem Backward, Hide, Var., Vol., Key Edit and 10 pounds more.
**SUPER UTILITY VI** (#081) Slide Maker, Assem., Trace, Vol Changer, XRef, and a Matrix Maker start you off right. The rest of the programs come in real handy.
**SUPER UTILITY VII** (#082) Printer Driver, Screen Dumps, H14 Driver, Printer Patch, Banner and much more. Lots of printer help.
**SUPER UTILITY VIII** (#083) A fist full of goodies. Fast Copier, Catalog Creator, Subroutine Pak, Typewriter, and etc.
**SUPER UTILITY IX** (#084) Undelete, Append Bin2Basic, Disk Summary and Edit, Error Handler (if you accidentally make a mistake!), Line Find and more.
**PRINTER UTILITIES** (#086) Printer help for Epson printers. Supports MX and FX doing everything. Labels, DBL Strike, demos and etc.
**PRINTER/MISC** (#087) More Epson help and schematic stuff. Also Epson Hires Dumps, games and etc.
**UTILITY MIX** (#101) Programs to increase Buffer, Copy Obj. Files, DVORAK Key Board, and more.
**MYSTERY MIX** (#103) Some utilities, some games, maybe just what you're looking for!
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**TALK TIME** (#105) Modem goodies. Answer on Nth Ring, Hayes Menu, Xfer, Selftest II and more.
**SAM'S PAK I** (#106) Utilities and games, what more do you want? OK, it's even got a Calculator In it, Screen goodies, Life, Text Ed., Towers and more.
**SUPER UTILITY X** (#111) Jamed packed full of useful help allows you to Convert, Display, Poke and play. Need I say more?
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**INK BLOT** (#118) Within these walls hides a Catalog Header Prog., File Zapper, Calendar, and more. The Cryptologic is good, if you're into that.
**JUPITER** (#119) Utilities and more for your use. Hires Noflash, Chatlog Manag., Disk Dump and mucho more.
**PLOT IT** (#122) Plot help for the needy. Will do more than you can guess.
**D-MAP** (#124) Disk Map, Label Printer, Screen Edit and many more,
**SAM'S PAK II** (#107) Another mixed bag of goodies. Games, educational stuff, and disk utilities. We'll even throw In a FREE charge of Static Electricity for you.

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**Microprocessor Kits** Z-80, 8085, 1802 $40; 2k EEPROM, 2k RAM, PPI parts, plans, wire wrap sockets. **Cox Computer,** Box 1581, Titusville, FL 32781-1581.

## (112) NORTHSTAR COMPUTERS

**Advantages Wanted!** Nonprofit, Tax-Exempt, organization seeks donations for community training program. We will provide fair and reasonable donation letters for your tax-deductible contribution. We will pay UPS postage. Contact: **Steve Coe,** Community Access, 95 Avenue A, NYC 10009. **212-420-1700.** 10-86

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## (112B) NORTHSTAR SOFTWARE, PERIPHERAL

## (113) COMMODORE COMPUTERS FOR SALE

**C64** with Frogger, Choplifter, Temple of Apshai software for $100. Call **Lee Turner, 504-641-2537.**

**CHEEP!!!**

Mucho C-64 software!! Too numerous to mention here. Mostly business, some games, all toooo cheap (Example: Print Shop $15, Easy Script $15, The Manager $15) Are We Crazy Or What!!! Call or write for list. **Shreve Systems,** 845 Lark Ave., Shreveport, LA 71105. **318-865-6743** 4—9pm CST. 12-84

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6510 $15; 6522 $8; 6526 $15; 6560 $15; 6567 $24; 6581 $22; 7701 $8; ROMS $12; PLA $18; 128/Other Parts Available.

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**C64's** $45 includes power supply; C128's $50 includes power supply; 1541's $50; 1571's $55; Sx-64's $65; All repairs carry a (30) day warranty. VISA/MC. **Major Computer Services,** Rt. 6, Box 806-M, Midland, TX 79703. **915-561-8483.** 12-88

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We buy, sell and horsetrade Apples, CoCo & Model 100, Commodore, IBM & Clones. Call Now! **Shreve Systems,** 845 Lark Ave., Shreveport, LA 71105. 4-9 pm CST. 9-83

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**Mint, Box** Commodore +4 with access to trade 64 games. Leave message with **Nick (Rowdy) 405-794-5095.**

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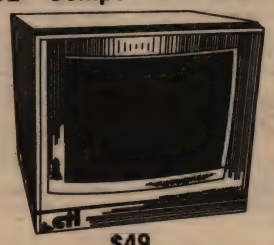

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**6 arcade** games plus 1 cartoon crammed onto 1 disk. Includes games like Shoot, Driver, Shuttle Debris, Ambulance, and other famous games. Runs on C-64 or C-128. Send $10 to **Solar Software,** 416 S. High St., Hartford City, IN 47348.

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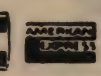

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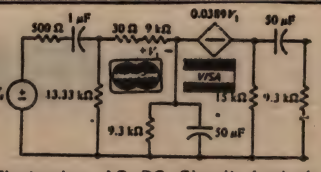


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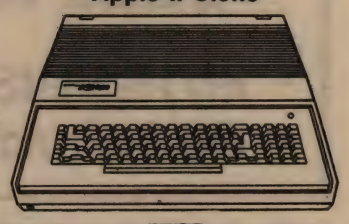

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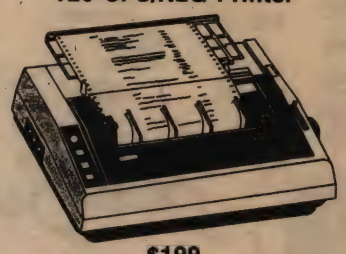

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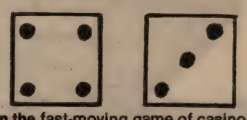

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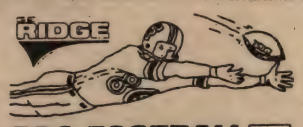


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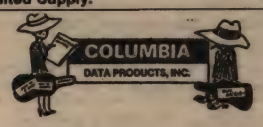


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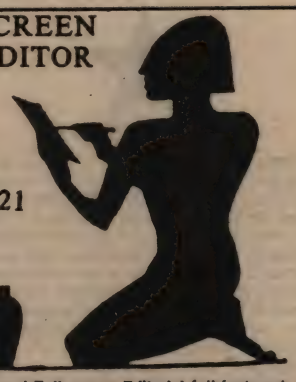

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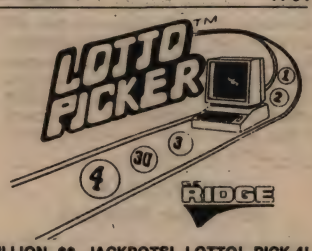


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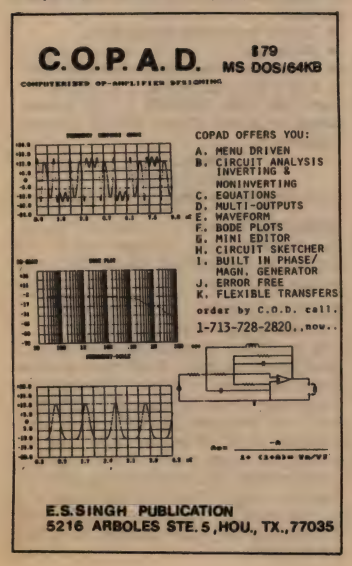


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**Sharp PC7000** new list $1995; Sale $1050 complete. **213-671-6075.** 11-84

## Toshiba T1100 Laptop

**Nearly new**—in original box—512K w/one 3.5" FDD, 300bps modem, excellent LCD plus RGB connector, RS-232/printer ports, fully portable @ 101b w/shoulder bag – owner anxious @ $1,199; external 5¼" FDD available extra. **215-582-2639.** 12-84

## (120A) MS/DOS COMPUTERS WANTED

## (120B) MS/DOS PERIPHERALS

## 120 CPS/NLQ Printer

### $199

**FACIT 4509**—Epson Compatible, IBM Character Set. 120 CPS Draft, 30 CPS NLQ, built-in tractor feed, parallel interface. 90 day warranty, 15 day 100% satisfaction guarantee.

**BCE 1-800-545-7447**

## 40 CPS Letter Quality Printer
### $349

**FACIT 4565P**—Made by TEC, mfr. of C. Itoh F10-40. Works with most word processing software. Tractorfeed and sheetfeeder also available. For complete details, see our ads for the Commodore 6400 in previous issues of *Computer Shopper.*

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**Ask for Operator 28**

**Hard Drives,** maxtor XT1065 (67 meg) $675; Maxtor XT1140 (143 meg) $1199; priam V170 (72 meg) $699; Priam V185 (85 meg) $899; Toshiba MK53A (43 meg) $499. All are full height 5¼ 30 millisecond or less. **Ed Lewis, ERD Systems, 617-851-5852, 617-452-6000.** 12-84

## (121) KAYPRO COMPUTERS FOR SALE

**Kaypro 10** with Dynax DX-15 printer, wordstar plus misc software $700 or best offer. **Richard Sieron,** 1470 Melville Ave., Fairfield, CT 06430.

**Kaypro-10** with 10meg hard disk, dBase, WordStar, and BASIC. All manuals included. $1200; **501-273-2511.** 11-85

**Kaypro 2000,** 768k RAM, internal 1200 baud modem, multi-adapter, color card, color monitor $2200 or reasonable offer. Ask for **Steve 303-699-0616.**

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GODFATHER'S used computer SYNDICATE

**$$$$ I Buy,** Sell, Trade, Osborne computers. Call for Prices. **GODFATHER'S USED COMPUTER SYNDICATE,** PO Box 3037, 1154 W. Hwy. 436, Forest City, FL 32714. **305-774-1111.**

## (121A) KAYPRO COMPUTERS WANTED

### SELL OR BUY FAST!

**Full Service Brokerage!** Easy, no risk. Only 1% (min. $20) to list, 10% when sold. Complete listing summary only $10. Visa/MC Accepted!

**1-800-843-6713**

**In Florida: (305) 459-1555**

**Phoenix MultiList Systems**

2755-C N. Banana River Dr., Merritt Island, FL 32952.

## (121B) KAYPRO SOFTWARE, PERIPHERALS

**$25 DRAWING PROGRAM!** works with ANY Kaypro, other CP/M computers. Point-to-point drawing is supplemented with commands for rectangles, circles, ellipses, lines, variable shading and erasing, and more. Little Artist That Can allows you to view a section of a 6x4" printout while drawing. A rough on-screen representation of the entire drawing is available at the press of a key. Printout with graphics-equipped Epson, Star and compatible printers. Simple, easy to use instructions on disk. **Dennis Gimlin,** Little Software That Can, PO Box 998, Rantoul, IL 61866. 10-83

**$36 ACCOUNTING SOFTWARE!** Little Accountant That Can maintains 100 personal or product accounts, prints statements, records expenses under 12 redefinable categories, and prepares summary reports (instant tax preparation). Ideal for small and home-based businesses. Compiled for CP/M Kaypros, BASICA/GWBASIC and MBASIC versions for other computers. **Dennis Gimlin,** Little Software That Can, PO Box 998, Rantoul, IL 61866. 10-83

## (123) SANYO COMPUTERS FOR SALE

**555-2 upgraded** with two 800K drives and HAGEN/DOS. "The Fox." Includes 256K comptuer, monochrome monitor, WordStar, CalcStar, EasyWriter, PC-File, BASIC, RS-232 and Centronics ports and CopyLink Terminal Software. Mint condition with ALL manuals. $675. Call **Bob 201-774-5566.**

**Buy/Sell/Trade** computers, parts, accessories. Best prices anywhere! Catalog. **International Surplus Electronics #105,** PO Box 750, Olmito, TX 78575. **512-546-4810.**

**Sanyo 550,** excellent shape. With 256k memory, one 360k, one 180k floppy, RS232, MS-DOS 2.11, WordStar, SpellStar, DataStar, Easywriter, Picasso, Intellicom, joystick, amber monitor, DC modem and printer cable $750; Ask $695 without monitor. **Call: Jim,** 216-961-4602 (Cleveland). 11-84

**Sanyo MBC-555,** 256k, RS-232, two drives, lots of software flawless, $750 OBO. **503-364-8703** eves. **G. Patterson,** 655 Welcome Way, Salem, OR 97302.

## (123A) SANYO COMPUTERS WANTED

**WANTED:** A-OK board for Sanyo 550, or plug in clone. Must be compatible with Sanyo Video RAM board. **305-595-6618.**

## (123B) SANYO SOFTWARE, PERIPHERAL

# RENT

**Public Domain & User Supported**

# Software

**for the**

# Sanyo 550/555

We have 110 volumes that you can rent and copy for $1 each or try our lowcost diskcopy service. Sampler disk $5.00

*only* **$1** Per Volume *for 10 day rental*

Send a #10 SASE for program listing and info or call our 24hr info/order line. *Please specify computer type.*

**(619) 941-3244**

MasterCard and Visa accepted

***FutureSystems***

Box 3040(C), Vista, CA 92083

**Money Back Guarantee!**

### Educational Games for Sanyo

**Written** by a professional educator, this exciting educational package uses great graphics, music and sound pedagogical techniques to make learning fun. It's called **The Smart Set,** and your 3-12 year-old will return again and again to practice math, spelling, telling time, and more. Three different games included; all run from a central menu. Makes a great Christmas gift! $34.95 + $3 s/h. MC/VISA or check. **MVP Software,** 1035 Dallas SE, Grand Rapids, MI 49507. **616-245-8376.** 12-84

**DOMAIN/COMMERCIAL** SOFTWARE! Rent DS/DD Diskfulls of SANYO 550/5 Software for $1, Buy $3 (including disk). **804-851-6864. Colony,** Box 808, Langley AFB, VA 23665.

***Easy Pack Special Sale*** EasyWriter II is an advanced word processor, with EasyMailer II. Easyfiler is an advanced database manager. EasyPlanner is a spread sheet. Complete four program package $49.95 + $5 s/h. A.S.A.P., 494 N. Mill, Plymouth, MI 48170. **313-455-2520.**

### BATTLE GROUND

**It's the** US vs. Germany as enemy platoons meet on the battlefield. Employing sophisticated animated graphics and many other advanced programming techniques, this new two-player game is sure to give you and a friend many hours of fun. Devise and execute battle strategy as you re-enact ground combat encounters typical of WWII. Players choose battlefield terrain and other options to insure that no two games will ever be exactly alike. **Bonus:** Also comes with two arcade games, Zap 'Em and Seawolf. $29.95 + $3 s/h. MC/VISA or check. **MVP Software,** 1035 Dallas SE, Grand Rapids, MI 49507. **616-245-8376.** 12-84

### SANYO 550/555 PUBLIC DOMAIN RENTALS

**110 VOLUMES**-RENT AND COPY for $1 each or we copy for you. $3 SSDD; $6 DSDD. Sampler $5. Mastercard, VISA! Recorded info/order **619-941-3244 (Anytime): Futuresystems,** Box 3040(C), Vista, CA. 92083.

**Sanyo** 550 256K 1-160 k drive $350; Comtel RS232 $25; Teac 55-B $60; RGB monitor $200; Infostar $75; Rascal $25; Intellicom $40; Modem 300B $25. **412-344-9445.**

★★★

### OZARK SOFTWARE

**Sanyo 550/555** Public Domain Library. Hundreds of programs to choose from! For a catalog send $2 (postal money order or check) to: **Ozark Software,** Box 10 Davis Creek Rt., West Plains, MO 65775. 12-85

**Public Domain** Software for Sanyo 550/555. All tested/translated for Sanyos. Games, financial, utilities, more. Small copy charge. Detailed catalog $1 (refundable). Free newsletter. **Software Library,** POB 204, Prosser, WA 99350.

**Rent and** copy our disk of financial routines for $2; Send two 22¢ stamps for description. **ProSpec,** 144 Cloister, Peachtree, GA 30269. 11-84

**Survey-Boundary** 55X/675 (specify) MS DOS 2.11 basic $29.95. Description $1. **P. Billings,** 12134 Bonnie Terr. Dept. CSA, Seminole, FL 33542. 6-83

★★★

**"Sanyo MBC** 550/555 Beginner/Intermediate Guide." 360+ pages and disk with 56 programs. $29.95 postpaid USA/Canada. VISA/MC okay. **818-346-7024, Fred Blechman,** 7217 Bernadine, Canoga Park, CA 91307. 9-84

**Source List** for Sanyo 550/555. What to buy and where to get it - software, hardware. Our own list, 20 full-sized pages, 350+ entries $3. **Conceptware,** POB 204, Prosser, WA 99350.

## (125) SINCLAIR COMPUTERS FOR SALE

★★★

**QL** with I.C.E. & War East—$289; Write for catalog. TS2068 software available. **Sharp's Inc.,** Rt 10 Box 459, Mechanicsville, VA 23111 **804-746-1664.** VISA/MC 11-85

# AFFORDABLE HARD DISKS FOR YOUR Z80

**HARD DISK SYSTEMS by Emerald Microware**

Now is the time to take advantage of the low prices on hard disk drives. We have everything you need from the host board to a complete turn-key system for your computer, order only as much as you need. Runs on Xerox 820-1 or -2, Kaypro, or most **ANY Z80** based system.

**HDS Host board**
- Plugs into Z80 socket, no wiring required (special 50 pin host is available for Kaypro 84 series computers)
- Interfaces directly with 40 pin Western Digital 1002 series controller boards
- Comes fully assembled and tested
- Switch selectable I/O addressing

**HDS Software package by MICROCode Consulting**
- Drivers locate above your existing operating system and BIOS, so it will not interfere with your other programs that install down below.
- Custom installs for your system without having to assemble any software
- Reserves system tracks and swaps so you can Warm Boot from hard drive
- Allows installation of up to two hard drives and two 5 ¼" floppies on one WD1002-05 controller board
- Runs diagnostic on system each time hard drive is installed
- Can be configured for 5 to 40 Meg hard drives, from menu or custom install
- Includes manual, FORMAT, TEST, PARK, INSTALL, and SWAP utilities

**Western Digital 1002-05 Hard Disk Controller Board**
- 5 ¼" profile with standard 5 ¼" power connection (only 5 VDC required)
- Has WD2797 floppy controller and interface on board
- Can control up to three hard drives and four 5 ¼" floppies.
- 40 pin host interface
- ST506 compatible hard drive interface

**HDS TURN-KEY HARD DISK SUBSYSTEM by Emerald Microware**
- External hard disk subsystem complete with all cables, controllers, hard drive, and cabinets with power supply, fully tested and burned in. Host adaptor and full installation kit supplied with software on disk format of your choice.
- Internal hard disk subsystem for '84 series Kaypro computers, complete with host, controller, cables, 3 ½" hard drive, mounting hardware, and fan.
- Available as 10, 20, or 40 Meg, single or multi-drive systems
- External units available with both hard disk and 5 ¼" quad density floppy drives installed

| | |
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| 10 Meg Single drive Subsystem | $ 795.00 |
| 20 Meg Single drive Subsystem | $ 995.00 |
| Host board with software package | $ 89.00 |
| WD1002-05 Hard disk controller board | $ 185.00 |
| WD1002-05 controller with Host and software | $ 250.00 |
| 20 Meg with dual 5 ¼" floppy subsystem | $1295.00 |

**XEROX BOARDS AND ACCESSORIES**

We stock a limited quantity of Xerox parts and accessories for the 820 computers.

| | |
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| Xerox 820-2 Main Computer Board | $ 95.00 |
| Xerox 820-2 Floppy controller board | $ 75.00 |
| Xerox 820-2 Main board with floppy controller board | $150.00 |
| Xerox 5 ¼" disk drive cable | $ 12.00 |
| Xerox internal video harness with brightness control | $ 9.00 |
| Parallel ASCII keyboard (no numeric pad) with docs | $ 25.00 |
| PC mount power connector for 820 board | $ 2.50 |
| Dual half height, 5 ¼" disk drives (new), DSDD - 48 TPI, in cabinet with Xerox standard cable | $265.00 |
| Dual half height, 5 ¼" disk drives (new), DSQD - 96 TPI, in cabinet with Xerox standard cable | $295.00 |

We guarantee satisfaction on all of our products or your money back. Include $4.00 shipping and handling, $7.00 for COD, call for Blue Label charges. Phone hours: 8:30am to 5:00pm weekdays; modem hours: 10:00pm to 8:00 am seven days a week.

**WE SUPPORT OUR CUSTOMERS**

***Is single density making your Xerox 820-1 feel crowded?***

**DOUBLE DENSITY FOR THE XEROX 820-1 OR BIG BOARD I**

Clearly the most versatile double density package available for the 820-1. Lets you run up to four disk drives at once, and mix 5 ¼" & 8". Runs almost all Kaypro and Xerox 820 software. Supports all standard printers and most add-ons such as the Ferguson ram board. Our ROM sets operate in banked mode to allow more space in the TPA for your programs. You get Mini-monitor functions, autoboot capability, automatic disk identification (up to 19 formats built in), IOBYTE enabled for device selections, and you can read and write 48 TPI disks on 96 TPI disk drives.

| | |
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| X120 Board - assembled and tested - with ROM set | $160.00 |
| X120 Board - full kit - with ROM set | $140.00 |
| X120 Bare board with ROM set | $ 72.00 |
| X120 Bare board only | $ 26.00 |
| ROM set only | $ 50.00 |
| Hard to find parts set (trimmers, caps, resistors) | $ 12.00 |
| WD2793 controller chip | $ 22.00 |

Other packages available.

***Can't find CP/M for your Xerox? Now you don't need it.***

**QP/M by MICROCode Consulting**

At last, an inexpensive replacement for CP/M, and you don't need CP/M to get started! Get full CP/M compatibility with many new options. Stamp your file with the time and date - transparent to your operation, automatically re-log your disks (no more control C), change your default drive search from the keyboard, use up to 31 USER areas, select your disk drives or user areas with semicolon or colon, maintains ARCHIVING bit for efficient backups (great for hard drives), and much, much more. Runs in native Z80 code, in the same space as CP/M 2.2. Has menu oriented install for use on ANY Z80 based system. Available as a bootable disk (with BIOS) for the Xerox 820-1, 820-2, 820-XPRO, 820-PLUS2, or Kaypro.

| | |
|---|---|
| QP/M, bootable for the Xerox 820-1, 820-2, or Kaypro | $ 80.00 |
| QP/M, bootable for the Xerox 820-1 using XPRO or PLUS2 | $ 65.00 |
| QP/M, without BIOS (not bootable) | $ 60.00 |

***Tired of carrying your computer back and forth? Why not just the diskette?***

**UNIFORM and UNIDOS by Micro Solutions**

The solution to the diskette incompatibility problem. This program allows files to be transferred back and forth between close to a hundred computer formats including between CP/M and MSDOS. Lists computers by name - no special technical knowledge required. Versions available from stock for the Kaypro (XPRO), Xerox 820-2, Morrow MD2&3, and IBM 100% compatibles. Other versions available on request. Unidos allows you to run CP/M 80 programs on your IBM compatible. Requires NEC V20 chip on P.C.

| | |
|---|---|
| Uniform or Unidos | $ 64.95 |
| IBM Uniform with Unidos and V20 | $145.00 |

**PANASONIC HALF HEIGHT DISK DRIVES**

These are some of the finest new 5 ¼" disk drives. They are fast, reliable, and have about the lowest power consumption around.

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| National JA551 (Shugart 455) - DSDD, 48 TPI | $114.00 |
| National JA561 (Shugart 465) - DSQD, 96 TPI | $129.00 |

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**128K Expandable** to 640K — 4 Business Programs included: Word Processor, Database, Spreadsheet and Business Graphics. 2 Serial ports, 2 j/s ports, LAN up to 64 machines, 2 built in MicroDrives. High-level languages available (Lattice C, Pascal, etc.), Graphics programs, Utilities. Suggested Retail under $300. Call for our package specials. We are the oldest authorized QL dealer in the US. Call or write for **FREE CATALOG.** 1-602-978-2902. 24 Hour Toll-free order line listed in catalog. **Curry Computer;** PO Box 5607, Glendale, AZ 85312-5607. 10-84

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**Sinclair QL** Package $299; You get the great QL and bundled software plus: -1 year extended warranty ($50 value) -QL Service Manual with schematics ($25 value) -Extra piece of software ($30 value); we stock the complete QL line including monitors, printers, etc. and service what we sell. Call Us! **Brice Road Pharmacy,** 1653 Brice Rd., Reynoldsburg, Ohio 43068. **614-861-3600.** 11-84

**TS 2068** Computer printer, Datasette 16K RAM module, programs, handbooks, magazines. Excellent condition $150 offer. **Tester,** 1212 Punahou St. 2902, Honolulu, HI 96826. **808-521-2759.** 8-84

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**QUANTUM COMPUTING**
POB 1280-H, Dover, NJ 07801. **201-328-8846.**

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## (125A) SINCLAIR COMPUTERS WANTED

**WANTED:** Alive TS1000 ZX81. Include price. **Tim Onay,** 4226 W. Fountain Way, Fresno, CA 93722.

**SINCLAIR QL & T/S2068**
Free catalog/call or write
**KNIGHTED COMPUTERS**
707 Highland St., Fulton, NY 13069
**315-593-8219/MC & VISA**

## (125B) SINCLAIR SOFTWARE, PERIPHERAL

**CLOSEOUT! TS1000/ZX81 Software From 99¢. SIMULUSION-CS4, Box 2382, LaJolla, CA 92038.** 11-84

**Disk Operating Systems for ZX-81 and 2068.** Uses double sided 5¼" drives. Saves Arrays, Basic and Code. many features $95 (US) + shipping. Send for information. Mention ***Computer Shopper.*** **Larken Electronics,** RR#2, Navan, Ontario, Canada K4B-1H9 12-84

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**FREE CATALOG,** Timex Sinclair 1000, 1500, 2068, Spectrum and QL. **Basically Programming,** Dept. C, 2528 W. Olive Avenue, Fullerton, CA 92633. **714-738-0666.** 6-83.

**FREE PROGRAMS!!!** Timex-1000/Timex-1500/ Timex-2068/ZX-81/IBMpc's/Apples/Adam/ TRS80's/TI99-4A/Commodores. Send stamps! **EZRAEZRA,** Box 5222-PNV, San Diego, CA 92105.

**Free Catalog** Timex Sinclair and QL hardware and software. Now offering new and used goodies. "Your Midwest Connection" **Midwest Micro-Computer Co.** 7039 Magnolia Dr., Jenison, Michigan 49428 11-83

**Free Catalog** Timex Sinclair Hardware and Software. Books, Spectrum programs, QL Information, British Magazines. **Curry Computer; P.O. Box 5607, Glendale, AZ 85312-5607; 602-978-2902.** Catalog lists **Toll Free Order Number.** 11-85

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**LOTTERY GAMES** for TS-1000 w/16k ZX-81 w/16k and the TS-1500. This program allows you to select numbers for 3-Digit, 4-Digit, and Lotto Games. Use Printer or copy from screen. Listing $4/ cassette $16. **W.L. MYERS,** PO Box 408, Hanover, PA 17331. 12-84

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**QL IN KIT FORM: $136!!!**

Motherboard is completely built, it only needs assembly into Keyboard case & wires snapped on!! Tools Used?? Only a Philips Screwdriver!! NO SOLDERING IS EVEN NECESSARY!! Complete with Manuals, Don't Miss this KIT SPECIAL! Makes an EXCELLENT GIFT! #K1 ..$136

**QL ONLINE PACKAGE SPECIALS!!**
Complete QL with Universal Modem hardware Adaptor & Windowing Terminal Program package (Includes Cable with D25 Plug) That's Everything you need to just hook it up to your modem and go right on line!! #P1.....$288

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FREEWARE INCLUDED WITH ALL Packages!!! Please include $12 for S&H with above package purchases! Catalog has all items.

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POB 1280-CS, Dover, NJ 07801
**201-328-8846.** 12-84

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**Spectrum Software** Converted your 2068 to Spectrum? Write for FREE CATALOG with latest Spectrum Programs from England. **Curry Computer,** PO Box 5607, Glendale, AZ 85312-5607. 9-83

## THE QL REPORT

**A Monthly Newsletter** published in the U.S. for QL owners and those interested in the QL. Software reviews, books, and hardware reviews, interviews with programmers and QL companies- and more. $15 for 12 issues. Published by: **Curry Computer,** PO Box 5607, Glendale, AZ 85312-5607. **602-978-2902.9-85**

## WANDERER QL

**3-D Graphics**/arcade game. Rated 5 stars in Sinclair User. 3D glasses included $37.95. **Curry Computer,** PO box 5607, Glendale, AZ 85312-5607. **1-602-978-2902** Dealer inquiries welcome. RGB color required. 9-85

## (126) MISCELLANEOUS MICROCOMPUTERS

**68K Multi-User Computer** QT plus2 68000 8MHz, never used 512k RAM—2 disk system multi-user, 4 users, 2 par. port, 4 ser. ports, 80 tracks QUME 101 terminal. OS9 O.S. system—basic09 stylo-graph wp. Dynacalc-S.S. speller, New $2600, asking $1500. **Doyle Alen,** 1011 Kennedy St., Camden, SC 29020. **803-432-5625** h., **803-432-9981** b. 12-84

**ALSPA Z80** two 8" SSDD Clock Calendar CP/M etc TeleVideo 925 terminal. $775 or offer. **Roger 404-875-2164.** 11-84

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**Full Service Brokerage!** Easy, no risk. Only 1% (min. $20) to list, 10% when sold. Complete listing summary only $10. Visa/MC Accepted!

**1-800-843-6713**
**In Florida: (305) 459-1555**

**Phoenix MultiList Systems**
2755-C N. Banana River Dr., Merritt Island, FL 32952.

**Colonial Computer** systems dual floppy, single floppy and 10 meg, 10 meg; Hazeltine terminals, teletype model 40; NEC spinwriter. Best offer. **Don Lundberg,** Box 88, Kewanee, IL 61443.

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**Compuro 8/16** Computer 1800 H19 $140; H89 $500; Morrow MD3 $400; Liberty Terminal $150. **415-895-2430.**

**Computers-Superbrain.** 5 Intertec compustar II Superbrain-Mint or like new condition; Intertec network controller; Intertec 144 MB harddisk storage system; Esprit 40 MB computer with Esprit 6310 terminal; Intertec Headstart computer; Commodore 64; Sheetfeeder Diablo 630; IMS, Peachtree, Excalibur software-some source code. Reasonable offers considered. **Skoog Data Design,** Chadwick, IL 61014. **815-684-5161.**

**Eagle-II** comptuer Z80A CP/M two drives monitor $375; Mint Okimate-20 color printer $175; BMC color monitor hires $225; Timberline software compelte business package cost $5000, sell $1000. **Gutcher,** 507 Central NE, Orange City, Iowa 51041. **712-737-4350.**

.. For an offer you can't refuse ...
GODFATHER'S used computer SYNDICATE

**$$$$ IBM** 5100 computer & 5130 printer $200 each part. As Is. IBM's first personal computer. Looks really good on your bookshelf though!! **GODFATHER'S USED COMPUTER SYNDICATE,** PO Box 3037, 1154 W. Hwy. 436, Forest City, FL 32714. **305-774-1111.**

**Micropolis/Vector Graphic** Users Group Monthly newsletter, hardware, software. **205-881-1697,** 604 Springwood Cir., Huntsville, AL 35803-1740. 8-87

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**OSM Zeus 4 User System** with 25MB HD, 20MB tape, 5¼" floppy, 2 Wyse 50 terminals, Toshiba 1351 Printer, MUSE Operating System, Spellbinder Word Processor. Excellent condition $10,160. Call **Dick 713-496-9074.** 7-83

**OTRONA ATTACHE:** CPU Boards $25; Video Boards $20; 8/16 boards $25; Remex Drives $7.50; Keyboards $25; Inner Chassis $20; Cases $25; Misc. Parts. 640k Memory Upgrades $260. Call or Write: **Brown Enterprises,** 11506 Adams St., Thornton, CO 80233. 303-452-1409. 10-86

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## PHILIPS P2012C PORTABLE

**Dual** operating systems, CP/M 2.2 and MS-DOS 2.1. dual high-density floppy drives. 9" amber monitor. 256K. Comes with Wordstar, Calcstar and Dataplot, plus operating systems. Printer and communications ports. new, in factory cartons. Immediate delivery. Original retail $2,495. Sell for only $399. Call **Steve, 800-752-5262.**

**Royal Alphatronic** PC. CP/M system. Amber monitor, detached keyboard, one 5-¼ DSDD, parallel and serial ports, user interface, Peachtree Write and Spreadsheet, ROM basic, and disc basic. Original packing and documentation $495. **805-962-6577** evenings.

**Tektronix 4051** OPT1 32k w/5 ROM packs incl., Editor, Matrix, Binary, 4050 EO1 ROM expander, 4631 Graphic hardcopier $1500. **503-642-9186.**

**Televideo TS-802** Super Buy. Dual floppy computer with word-processing (WordStar), financial planner (CalcStar), and BusinessMaster accounting with CBASIC source code, all for $850. Mint—never registered. **Harry Beerman 219-639-3035.** 12-84

**Televideo TS803,** CP/M 80, 2 DSDD drives $450; Televideo TS1603 CP/M 86 and MS/DOS, 2 DSDD drives $475; Televideo TPC-1 portable, CP/M 80, 2 DSDD drives $550; Morrow MD-3 with MDT 50 terminal $475. Plus shipping. **301-721-2188.**

**VECTOR GRAPHIC**
**V4/30** 5 MB HD-630 KB floppy 8 or 16 bit; **V4/40** as above but with 10 MD hard disk; **V4S/ 30** as above but S. Sector 739 KB FD; **V4S/40** as above but with 10 MD HD; **NEC 7700Q** Printer 55 CPS Centronics Para; **C. Itoh F-10-40** 40 CPS Daisy Wh. w/tractor; All equipment is perfect and in original boxes and have word procl. and spr. sheet programs and more included. CP/M, MS-DOS. **M. Richman 813-885-1789.** 12-85

## (127) XEROX COMPUTERS FOR SALE

**Xerox 16/8** Computer 10MB 8" hard drive and 8" floppy $850. Call **505-522-2033.**

**Xerox 820** 2dd, Supercalc, SelectWP, CP/M 2.2 & manuals. Disk drive needs work $650 obo. **Lars Carver, 619-325-1751** pst.

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**Xerox 820II** with 2-8" drives. Excellent condition. WordStar, Supercalc Mailer, other software included. Days: **Richard or Dawn, 305-891-2421.** 12-84

## (127A) XEROX COMPUTERS WANTED

## (127B) XEROX SOFTWARE, PERIPHERAL

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**KEYBOARDS $25.** See "APPLE BUILDER KEYBOARD" ad in category 108 for a super, full ASCII, 83 key keyboard which also works great with the Big Board/820 series computers. Thanks, **Electrovalue Industrial.** 10-84

**Diablo 630** LQ w/forms tractor $700. **Lars Carver 619-325-1751** pst.

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**New bios** for cpm now allows simultaneous operation of up to four 5¼ and four 8 inch single or double sided floppies. Requires ribbon cable type drive cables $59.95. Also bios for 5¼ only system allows 350k storage on 80 track double sided 5¼ drives. Supports 40SS, 40TDS, 80TSS, 80TDS simultaneously, two total drives $39.95. Includes source, format, single drive copy, and sysgen programs. Also includes new monitor eproms which allow boot from either keyboard or a separate terminal, and also allow the Xerox to function as a stand alone ASCII terminal without disk drives. With the purchase of either of the above systems, we offer MRS/OS, a completely CPM compatible operating system, for an additional $19.95. This system comes on bootable disks and runs all commercial CPM software. Includes users manual. Composite video adapter board inputs Xerox video signals and outputs proper composite video for monitors. A&T PC board with all proper connectors. Requires minor soldering on the 820-1, $17.95. **Eugene M. Toner,** PO Box 69, Fountainville, PA 18923. Check, M.O., VISA, MC **215-249-0673** 9am to 5pm daily orders, 6:30pm to 10:30pm EST Thursday for technical questions.

## (128) MISC. MICRO, SOFTWARE, PERIPH.

**1000's of FREE** SOFTWARE programs for over 80 computer formats including IBM, CP/M & COMMODORE from the PUBLIC DOMAIN USERS GROUP. Over 10000 members worldwide. For information send large SASE to **PUBLIC DOMAIN USERS GROUP,** Box 1442-C3, Orangepark, FL 32067. 11-84

**5 Megabyte** Hard Disk Drives, 2 for $100; These are 8" SA1002 Shugart Winchesters. Controller kit $200. Will interface to most computers: 6809, Z80, STD, S-100, Flex, CP/M, Apple, Heath. Call **DIGITAL SEARCH, 803-877-9444**

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**DIGITIZER TABLET** 11"x11" Houston Instruments HIPAD w/4 button cursor, documentation. Asking $500 willing to negotiate. Call **301-685-0656** evenings.

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**Wanted: Victor** 9000 CAD software, prefer AutoCAD or CAD9000. **Bill Houk,** 846 Parkside Blvd., Claymont, DE 19703.12-84

**Z-80 5mhz** SBC—these boards come complete with ADC's, DAC's, programmable baud rate generator, 2K static RAM and 2K EPROM. Will make excellent controllers, or use for robotics. We will burn your custom EPROM for free...$35 with schematics. **MEGATECH, 203-634-4593,** M-F, 9-5, PO Box 4213, Yalesville Station, CT 06492. We buy, sell, and horsetrade—call or write today! Free catalog.

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**ADC Super-Six** (6-Mhz, Z-80, 128k) S-100 system; 10-slot Integrand chassis; 2-8" and 1-5¼" floppies; 15M hard disk w/controller; 1200B modem; ZCPR3/ZRDOS; assorted software; everything works perfectly; complete documentation; Asking $1250. Also: MicroDaSys Super-Z; Tarbell DD floppy controller; Make offer. Everything negotiable. **John Noonan,** 25269 Via Sistine, Valencia, CA 91355. **805-255-5833.** 12-84

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**CompuPro S-100** Cards: RAM21 (128KX8 or 64KX16 fast static RAMS) $100; Interfacer $100; Disk1 $100; Call **516-334-0130 L.I. Computer Solutions Inc.** We accept ??

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**CCS-300 Mainframe** dual 8" drives. 5 boards. Z80-B, 2 serial, 1 parallel. 64K RAM. 4 port serial. Clock 5" or 8" disk controller. 12 slots. Large P/S. S/W galore! BASIC, Fortran, Pascal, Supercalc, WordStar, Mailmerge, dBase 2. With all manuals, diagnostics and original packing. $1000 or make an offer. **Ned Pepper 617-262-3398.** 11-83

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**Compupro/Godbout** S-100 boards Demo and used boards with 6 month warranty. CPU-80286 $350; CPU-8086 or CPU-8085/8088 or CPU-68k $200; Disk-1 $175; Disk 1A $300; Disk-3 $350; RAM-20 $75; RAM-23 $210; S-100 mainframe $500. call or write **Michael Louie, 714-820-1258,** 1118 Lancewood Ave., Rialto, CA 92376.

**Cromeco 512K** RAM cards $300; Morrow cards: 256K RAM boards $200; multi-I/O card $200; MPZ Z-80 card $200; disk controller card $200; HDC hard disk controller $200; All working, with complete documentation, 90-day warranty. Vector Electronics 11-slot backplanes $75; Wonderbus 14-slot backplane with complete system: hard disk drive (40 meg.), dual floppies, 4 serial ports, 2 parallel ports, 512K memory, CPM 2.2, much software, all $2000. **MEGATECH, 203-634-4593,** M-F, 9-5, PO Box 4213, Yalesville Station, CT 06492. We buy, sell, and horsetrade - Call today!

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**S-100, Z-80 Computer System for Sale.** 12 slot XOR main frame + power supply, dual Shugart 801-R SSDD disc drives; Digital Research 24x80 video board; interface card with 8 channel, 8-bit A/D. CPU = Advanced Digital 6Mhz Z-80B with 2 serial, 2 parallel ports, 128K memory, Extensive software, manuals, and reference books included. Amber monitor, dot-matrix printer complete the system. **John Gruner, 914-271-9232.**

**S-100 type** metal boxes 17"w, 7"h, 17½"d. 10 slot & 18 slot motherboards with connectors wide selection of Altair boards & controllers. Micropolis 100 + P1 drives for S100 controllers. **Suntec Computers,** 1523 Eubank NE, Albuquerque, NM 505-298-0800.

**VECTOR GRAPHIC**

**V4/30** 5 MB HD-630 KB floppy 8 or 16 bit; **V4/40** as above but with 10 MD hard disk; **V4S/ 30** as above but S. Sector 739 KB FD; **V4S/40** as above but with 10 MD HD; **NEC 7700Q** Printer 55 CPS Centronics Para; **C. Itoh F-10-40** 40 CPS Daisy Wh. w/tractor; All equipment is perfect and in original boxes and have word procl. and spr. sheet programs and more included. CP/M, MS-DOS. **M. Richman 813-885-1789.** 12-85

**XOR S-100** machine, 12-slot motherboard, Z80, 64kb, two 8" Qume DS/DD disk drives, Televideo 910+ terminal, CP/M 2.2, cables. $500 or BO. **Peter Fenton,** 24 Duncklee Street, Newton, MA 02161. **617-964-7222.**

## (130) S-100 COMPATIBLE PERIPHERAL

**5 Megabyte** hard Disk Drive Subsystem for all S-100 systems. Kit $450. **DIGITAL SEARCH, 803-877-9444**

**IMSAI 8080** S100 Chassis $195; Electronic systems serial I/O $25; 8k-static RAM $25; 32k-Static RAM $65; 8080 CPU $40; Z80 $60; CDC 8" SSSD $45; DG-Nova2 w/Doc $175. **Jim Carroll 615-355-1061.** 7-83

**Wanted: Tecmar TM-AD212 A/D** converter for S-100 Bus. **Robert Reinking,** Dept. of Physiology Univ. of Arizona, Tucson, AZ 85724. 11-84

## (131) S-50 COMPATIBLE PERIPHERAL

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**H/Z 90,** 64k two DS/DD 96tpi drives, green screen, word processor with manual and CPM $695 + shipping. **217-753-2737. George W. Tinkham,** 833 S. 4th, Springfield, IL 62703. 12-84

## (132A) HEATH SOFTWARE, PERIPHERAL

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**Burroughs B700** processor, disk drive, console and B9249 line printer. Also misc. roll paper, ribbons, tapes and covers for same. Best offer. **Wescott Assoc. Inc.,** 2661 Metro Blvd., Maryland Heights, MO 63043. 12-84

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## HELP

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**201-782-7814. 8-84**

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**HP86B Demo** models, with 9121 S/D 82913A, 12" CRT and 7470A-002 plotter, most like new. **Stephen Computer Services, 313-478-1868, 34700 Grand River Ave., Farmington, MI 48024.** 7-83

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## (134B) HEWLETT PACKARD SOFTWARE, PERIPH.

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## (136) DATA GENERAL SYSTEMS

## (138) DATA GENERAL, SOFTWARE PERIPH.

## (148) DEC SYSTEMS FOR SALE

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**DEC Systems** (1103/LK), KD11H CPU, BA11MA 5" chassis, 4x4 backplane, 64k MOSD, 2 DLV11E, H9642 cabinet, 2 8" Shugart DSDD drives in Sigma chassis, $750; **DEC Components,** MSV11DD $75; MXV11AC $200; KD11h, LSI-11/2 CPU $200; Sigma 5" chassis with 8" floppy and power for hard drive $300; **DEC Compatible Systems,** General Robotics case and P.S., KDF11AA (11/23) CPU, DLV11J, 256k, RAM, 5¼" floppy, 20 Mbyte Hard disk and controller, all in 7" high desktop case $2495; system as above with 1.2 Mbyte floppy, 10 Mbyte hard disk, 64k, LSI-11/2 CPU, $1500. **Urban Research Assoc. 916-278-6482** or **933-1410** after 5. 12-84

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## (149) DEC SYSTEMS WANTED

## (150) DEC SOFTWARE, PERIPHERAL

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## (155) IBM SYSTEMS WANTED

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## (156) IBM SOFTWARE PERIPHERAL

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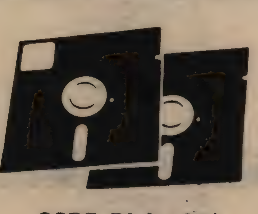

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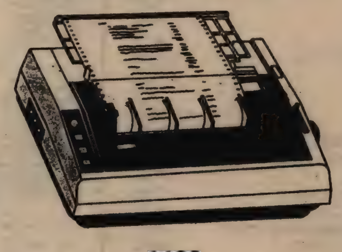

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## 7400

| Part No. | 1-9 | 10+ | Part No. | 1-9 | 10+ |
|---|---|---|---|---|---|
| 7400 | .29 | .19 | 7485 | .65 | .55 |
| 7402 | .29 | .19 | 7486 | .45 | .35 |
| 7404 | .35 | .25 | 7489 | 2.05 | 1.95 |
| 7405 | .39 | .29 | 7490 | .49 | .39 |
| 7406 | .39 | .29 | 7493 | .45 | .35 |
| 7407 | .39 | .29 | 74121 | .45 | .35 |
| 7408 | .35 | .25 | 74123 | .59 | .49 |
| 7410 | .35 | .25 | 74125 | .55 | .45 |
| 7414 | .49 | .39 | 74126 | .75 | .65 |
| 7416 | .45 | .35 | 74143 | 4.05 | 3.95 |
| 7417 | .45 | .35 | 74150 | 1.35 | 1.25 |
| 7420 | .35 | .25 | 74154 | 1.35 | 1.25 |
| 7430 | .35 | .25 | 74158 | 1.59 | 1.49 |
| 7432 | .39 | .29 | 74173 | .85 | .75 |
| 7438 | .39 | .29 | 74174 | .65 | .55 |
| 7442 | .55 | .45 | 74175 | .65 | .55 |
| 7445 | .79 | .69 | 74176 | .99 | .89 |
| 7446 | .89 | .79 | 74181 | 1.95 | 1.85 |
| 7447 | .89 | .79 | 74189 | 2.05 | 1.95 |
| 7448 | 2.05 | 1.95 | 74193 | .79 | .69 |
| 7472 | .75 | .65 | 74198 | 1.85 | 1.75 |
| 7473 | .45 | .35 | 74221 | .99 | .89 |
| 7474 | .45 | .35 | 74273 | 2.05 | 1.95 |
| 7475 | .49 | .39 | 74365 | .69 | .59 |
| 7476 | .45 | .35 | 74367 | .69 | .59 |

## 74LS

| | | | | | |
|---|---|---|---|---|---|
| 74LS00 | .29 | .19 | 74LS165 | .75 | .65 |
| 74LS02 | .29 | .19 | 74LS166 | .99 | .89 |
| 74LS04 | .35 | .25 | 74LS173 | .59 | .49 |
| 74LS05 | .35 | .25 | 74LS174 | .49 | .39 |
| 74LS06 | 1.09 | .99 | 74LS175 | .49 | .39 |
| 74LS07 | 1.09 | .99 | 74LS189 | 4.59 | 4.49 |
| 74LS08 | .29 | .19 | 74LS191 | .59 | .49 |
| 74LS10 | .29 | .19 | 74LS193 | .79 | .69 |
| 74LS14 | .49 | .39 | 74LS221 | .69 | .59 |
| 74LS27 | .35 | .25 | 74LS240 | .79 | .69 |
| 74LS30 | .29 | .19 | 74LS243 | .79 | .69 |
| 74LS32 | .35 | .25 | 74LS244 | .79 | .69 |
| 74LS42 | .49 | .39 | 74LS245 | .89 | .79 |
| 74LS47 | .99 | .89 | 74LS259 | .99 | .89 |
| 74LS73 | .39 | .29 | 74LS273 | .89 | .79 |
| 74LS74 | .35 | .25 | 74LS279 | .49 | .39 |
| 74LS75 | .39 | .29 | 74LS322 | 4.05 | 3.95 |
| 74LS76 | .55 | .45 | 74LS365 | .49 | .39 |
| 74LS85 | .59 | .49 | 74LS366 | .49 | .39 |
| 74LS86 | .35 | .25 | 74LS367 | .49 | .39 |
| 74LS90 | .49 | .39 | 74LS368 | .49 | .39 |
| 74LS93 | .49 | .39 | 74LS373 | .79 | .69 |
| 74LS123 | .59 | .49 | 74LS374 | .79 | .69 |
| 74LS125 | .49 | .39 | 74LS393 | .89 | .79 |
| 74LS138 | .49 | .39 | 74LS590 | 6.05 | 5.95 |
| 74LS139 | .49 | .39 | 74LS624 | 2.05 | 1.95 |
| 74LS154 | 1.09 | .99 | 74LS629 | 2.29 | 2.19 |
| 74LS157 | .45 | .35 | 74LS640 | 1.09 | .99 |
| 74LS158 | .45 | .35 | 74LS645 | 1.09 | .99 |
| 74LS163 | .59 | .49 | 74LS670 | 1.09 | .99 |
| 74LS164 | .59 | .49 | 74LS688 | 2.05 | 1.95 |

## 74S/PROMS*

| | | | |
|---|---|---|---|
| 74S00 | .29 | 74S188* | 1.29 |
| 74S04 | .35 | 74S189 | 1.69 |
| 74S08 | .35 | 74S196 | 2.49 |
| 74S10 | .29 | 74S240 | 1.49 |
| 74S32 | .35 | 74S244 | 1.49 |
| 74S74 | .45 | 74S253 | .79 |
| 74S85 | 1.79 | 74S287* | 1.49 |
| 74S86 | .35 | 74S288* | 1.49 |
| 74S124 | 2.95 | 74S373 | 1.49 |
| 74S174 | .79 | 74S374 | 1.49 |
| 74S175 | .79 | 74S472* | 2.95 |

## 74ALS

| | | | |
|---|---|---|---|
| 74ALS00 | .35 | 74ALS138 | .89 |
| 74ALS02 | .35 | 74ALS174 | .89 |
| 74ALS04 | .39 | 74ALS175 | .89 |
| 74ALS08 | .39 | 74ALS240 | 1.49 |
| 74ALS10 | .39 | 74ALS244 | 1.49 |
| 74ALS27 | .39 | 74ALS245 | 1.49 |
| 74ALS30 | .39 | 74ALS373 | 1.69 |
| 74ALS32 | .39 | 74ALS374 | 1.69 |
| 74ALS74 | .49 | 74ALS573 | 1.69 |

## 74F

| | | | |
|---|---|---|---|
| 74F00 | .39 | 74F139 | .89 |
| 74F04 | .39 | 74F157 | .95 |
| 74F08 | .39 | 74F193 | 3.95 |
| 74F10 | .39 | 74F240 | 1.39 |
| 74F32 | .39 | 74F244 | 1.39 |
| 74F74 | .49 | 74F253 | .99 |
| 74F86 | .59 | 74F373 | 1.39 |
| 74F138 | .89 | 74F374 | 1.39 |

## CD—CMOS

| | | | |
|---|---|---|---|
| CD4001 | .19 | CD4081 | .25 |
| CD4011 | .19 | CD4082 | .25 |
| CD4013 | .29 | CD4093 | .35 |
| CD4016 | .29 | CD4094 | .89 |
| CD4017 | .55 | CD40103 | 2.49 |
| CD4018 | .59 | CD4503 | .35 |
| CD4020 | .59 | CD4510 | .69 |
| CD4024 | .49 | CD4511 | .69 |
| CD4027 | .35 | CD4515 | .89 |
| CD4030 | .29 | CD4518 | .75 |
| CD4040 | .65 | CD4520 | .75 |
| CD4049 | .29 | CD4522 | .79 |
| CD4050 | .29 | CD4538 | .79 |
| CD4051 | .59 | CD4541 | .69 |
| CD4052 | .59 | CD4543 | .79 |
| CD4053 | .59 | CD4553 | 4.95 |
| CD4059 | 3.95 | CD4555 | .79 |
| CD4060 | .65 | CD4566 | 2.49 |
| CD4066 | .29 | CD4572 (MC14572) | .39 |
| CD4069 | .25 | CD4583 | .89 |
| CD4070 | .25 | CD4584 | .39 |
| CD4071 | .25 | CD4585 | .89 |
| CD4072 | .25 | MC14411P | 8.95 |
| CD4076 | .65 | MC14490P | 4.49 |

## COMMODORE CHIPS

| Part No. | Price | Part No. | Price | Part No. | Price |
|---|---|---|---|---|---|
| SI-3052P 5V Pos. Reg. 2A | 5.95 | 6545-1 CRTC | 2.49 | 8701 Clock Chip | 9.95 |
| 6502 MPU w/Clock | 2.25 | 6551 ACIA | 3.29 | *8721 PLA | 14.95 |
| 6504A CPU | 1.95 | 6560 VIC-I | 10.95 | 8722 MMU | 9.95 |
| 6507 CPU | 4.95 | 6567 VIC-II | 14.95 | 251104-04 Kernal ROM | 10.95 |
| 6508 MPU w/RAM & I/O | 8.95 | 6569 VIC PAL | 14.95 | 325572-01 Logic Array | 24.95 |
| 6510 CPU | 9.95 | 6572 VIC PAL-N | 14.95 | *82S100PLA (906114-01)** | 13.95 |
| 6520 PIA | 1.75 | 6581 SID | 14.95 | 901225-01 Char. ROM | 11.95 |
| 6522 VIA | 2.95 | 8360 Text Editing | 10.95 | 901226-01 BASIC ROM | 11.95 |
| 6525 TPI | 7.95 | 8501 MPU | 10.95 | 901227-03 Kernal ROM | 11.95 |
| 6526 CIA | 14.95 | 8502 MPU | 7.95 | 901229-05 Upgrd. ROM | 15.95 |
| 6529 SPI | 4.95 | 8563 CRT Contr. | 15.95 | *No spec. avail. 8721 and 82S100PLA | |
| 6532 128x8 RAM, I/O, Tim Ar | 6.49 | 8564 VIC | 15.95 | **NOTE: 82S100PLA = U17 (C-64) | |

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## MICROPROCESSOR COMPONENTS

| MICROPROCESSOR CHIPS Part No. | Price |
|---|---|
| D765AC | 4.49 |
| CDP1802CE | 4.95 |
| 2661-3 | 5.95 |
| **Z80, Z80A, Z80B SERIES** | |
| Z80 | 1.25 |
| Z80-CTC | 1.79 |
| Z80-DART | 4.95 |
| Z80-PIO | 1.79 |
| Z80A | 1.35 |
| Z80A-CTC | 1.49 |
| Z80A-DART | 4.95 |
| Z80A-PIO | 1.49 |
| Z80A-SIO/0 | 4.95 |
| Z80B | 2.95 |
| Z80B-CTC | 3.49 |
| Z80B-PIO | 4.29 |
| **6500/6800/68000 SER.** | |
| 6502 | 2.25 |
| 65C02 (CMOS) | 8.95 |
| 6520 | 1.75 |
| 6522 | 2.95 |
| 6532 | 6.49 |
| 6551 | 3.29 |
| 6800 | 1.75 |
| 6802 | 3.49 |
| 6810 | 1.25 |
| 6821 | 1.29 |
| 6840 | 3.95 |

| 6500/6800/68000 Cont. Part No. | Price |
|---|---|
| 6843 | 2.95 |
| 6845 | 2.95 |
| 6850 | 1.49 |
| 6852 | 3.95 |
| 68000L8 | 11.95 |
| 68661PB | 5.95 |
| **8000 SERIES** | |
| 8031 | 2.95 |
| 80C31BH | 14.95 |
| 8035 | 1.49 |
| 8073 | 29.95 |
| 8080A | 2.49 |
| 8085A | 2.29 |
| 8086 | 6.95 |
| 8086-2 | 8.95 |
| 8087 (5MHz) | 125.00 |
| 8087-2 (8MHz) | 159.95 |
| 8088 | 6.49 |
| 8088-2 | 8.95 |
| 8116 | 4.95 |
| 8155 | 1.95 |
| 8155-2 | 2.49 |
| 8156 | 2.49 |
| 8202 | 9.95 |
| 8203 | 14.95 |
| 8212 | 1.49 |
| 8224 | 2.25 |
| 8228 | 2.49 |

| 8000 SERIES Cont. Part No. | Price |
|---|---|
| 8237-5 | 4.95 |
| 8243 | 2.25 |
| 8250A | 5.49 |
| 8250B (For IBM) | 6.95 |
| 8251A | 1.75 |
| 8253-5 | 1.95 |
| 8254 | 2.95 |
| 8255A-5 | 1.69 |
| 8257-5 | 2.49 |
| 8259-5 | 1.95 |
| 8272 | 4.49 |
| 8279-5 | 2.95 |
| 8741 | 10.95 |
| 8748 | 7.95 |
| 8749 | 9.95 |
| 8751 | 39.95 |
| 8755 | 14.95 |
| **DATA ACQUISITION** | |
| ADC0804LCN | 3.19 |
| ADC0808CCN | 5.95 |
| ADC0809CCN | 3.95 |
| ADC0816CCN | 14.95 |
| ADC0817CCN | 8.95 |
| DAC0808LCN | 1.95 |
| DAC1008LCN | 6.49 |
| AY-3-1015D | 4.95 |
| AY-5-1013A | 3.95 |

### DYNAMIC RAMS

| Part No. | Function | | Price |
|---|---|---|---|
| 4116-15 | 16,384 x 1 | (150ns) | .89 |
| 4128-20 (Piggyback) | 131,072 x 1 | (200ns) | 4.49 |
| 4164-150 | 65,536 x 1 | (150ns) | 1.15 |
| 4164-200 | 65,536 x 1 | (200ns) | .95 |
| TMS4416-12 | 16,384 x 4 | (120ns) | 4.25 |
| 8118 | 16,384 x 1 | (120ns) | .69 |
| 41256-150 | 262,144 x 1 | (150ns) | 2.95 |
| 50464-15 | 65,536 x 4 | (150ns) (4464) (41464) | 4.95 |

### STATIC RAMS

| | | | |
|---|---|---|---|
| 2016-12 | 2048 x 8 | (120ns) | 1.69 |
| 2102 | 1024 x 1 | (350ns) | .89 |
| 2102-2L | 1024 x 1 | (250ns) Low Power (91L02) | 1.95 |
| 2114N | 1024 x 4 | (450ns) | .99 |
| 2114N-L | 1024 x 4 | (450ns) Low Power | 1.09 |
| 2114N-2 | 1024 x 4 | (200ns) | 1.05 |
| 2114N-2L | 1024 x 4 | (200ns) Low Power | 1.49 |
| 21C14 | 1024 x 4 | (200ns) (CMOS) | .49 |
| 2149 | 1024 x 4 | (45ns) | 4.95 |
| 5101 | 256 x 4 | (450ns) CMOS | 1.95 |
| 6116LP-2 | 2048 x 8 | (120ns) Low Power CMOS | 2.95 |
| 6116P-3 | 2048 x 8 | (150ns) CMOS | 1.89 |
| 6116LP-3 | 2048 x 8 | (150ns) Low Power | 1.95 |
| 6264P-12 | 8192 x 8 | (120ns) CMOS | 3.89 |
| 6264LP-12 | 8192 x 8 | (120ns) Low Power CMOS | 4.25 |
| 6264P-15 | 8192 x 8 | (150ns) CMOS | 3.59 |
| 6264LP-15 | 8192 x 8 | (150ns) Low Power CMOS | 3.75 |
| 6514 | 1024 x 4 | (350ns) CMOS (UPD444C) | 4.49 |
| 43256-15L | 32,768 x 8 | (150ns) Low Power | 24.95 |

### PROMS/EPROMS

| | | | |
|---|---|---|---|
| 1702A | 256 x 8 | (1μs) | 6.95 |
| TMS2516 | 2048 x 8 | (450ns) 25V | 4.95 |
| TMS2532 | 4096 x 8 | (450ns) 25V | 5.95 |
| TMS2564 | 8192 x 8 | (450ns) 25V | 8.95 |
| 2708 | 1024 x 8 | (450ns) | 4.95 |
| TMS2716 | 2048 x 8 | (450ns) 3 voltage | 9.95 |
| 2716 | 2048 x 8 | (450ns) | 3.75 |
| 2716-1 | 2048 x 8 | (350ns) 25V | 4.95 |
| 27C16 | 2048 x 8 | (450ns) 25V (CMOS) | 6.49 |
| 2732 | 4096 x 8 | (450ns) | 3.95 |
| 2732A-20 | 4096 x 8 | (200ns) 21V | 4.25 |
| 2732A-25 | 4096 x 8 | (250ns) 21V | 3.95 |
| 2732A-45 | 4096 x 8 | (450ns) 21V | 3.75 |
| 27C32 | 4096 x 8 | (450ns) 25V (CMOS) | 6.49 |
| 2764-20 | 8192 x 8 | (200ns) 21V | 4.25 |
| 2764-25 | 8192 x 8 | (250ns) 21V | 3.75 |
| 2764A-25 | 8192 x 8 | (250ns) 12.5V | 4.25 |
| 2764-45 | 8192 x 8 | (450ns) 21V | 3.49 |
| 27C64 | 8192 x 8 | (450ns) 21V (CMOS) | 5.49 |
| 27128-25 | 16,384 x 8 | (250ns) 128K 21V | 4.25 |
| 27128A-25 | 16,384 x 8 | (250ns) 12.5V | 4.95 |
| 27C128-25 | 16,384 x 8 | (250ns) 21V (CMOS) | 5.95 |
| 27256-25 | 32,768 x 8 | (250ns) 256K (12.5V) | 5.95 |
| 27C256-25 | 32,768 x 8 | (250ns) 256K (CMOS) (12.5V) | 8.95 |
| 27512-25 | 65,536 x 8 | (250ns) 512K (12.5V) | 19.95 |
| 68764 | 8192 x 8 | (450ns) 25V | 15.95 |
| 68766 | 8192 x 8 | (350ns) 25V | 16.95 |
| 74S387 | 256 x 4 | PROM O.C. | 1.29 |
| 74S471 | 256 x 8 | PROM T.S. | 4.95 |
| N82S123 | 32 x 8 | PROM T.S. | 2.49 |

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| Part No. | Price | Part No. | Price |
|---|---|---|---|
| 74HC00 | .25 | 74HC175 | .69 |
| 74HC02 | .25 | 74HC221 | .99 |
| 74HC04 | .29 | 74HC240 | .79 |
| 74HC08 | .29 | 74HC244 | .79 |
| 74HC10 | .29 | 74HC245 | .89 |
| 74HC14 | .49 | 74HC253 | .59 |
| 74HC30 | .29 | 74HC259 | .65 |
| 74HC32 | .29 | 74HC273 | .79 |
| 74HC74 | .39 | 74HC373 | .79 |
| 74HC75 | .39 | 74HC374 | .79 |
| 74HC76 | .45 | 74HC393 | .75 |
| 74HC85 | .79 | 74HC595 | 1.19 |
| 74HC86 | .39 | 74HC688 | .79 |
| 74HC123 | .89 | 74HC4040 | .89 |
| 74HC125 | .49 | 74HC4049 | .59 |
| 74HC132 | .49 | 74HC4050 | .59 |
| 74HC138 | .49 | 74HC4060 | 1.09 |
| 74HC139 | .49 | 74HC4511 | 1.29 |
| 74HC154 | 1.19 | 74HC4514 | 1.19 |
| 74HC163 | .65 | 74HC4538 | .89 |
| 74HC174 | .69 | 74HC4543 | 1.19 |

## 74HCT — CMOS TTL

| | | | |
|---|---|---|---|
| 74HCT00 | .29 | 74HCT139 | .59 |
| 74HCT02 | .29 | 74HCT157 | .69 |
| 74HCT04 | .29 | 74HCT174 | .69 |
| 74HCT08 | .29 | 74HCT175 | .69 |
| 74HCT10 | .29 | 74HCT240 | .99 |
| 74HCT32 | .29 | 74HCT244 | .99 |
| 74HCT74 | .49 | 74HCT245 | 1.19 |
| 74HCT86 | .49 | 74HCT373 | 1.19 |
| 74HCT138 | .59 | 74HCT374 | 1.19 |

## 74C—CMOS

| | | | |
|---|---|---|---|
| 74C00 | .29 | 74C174 | .79 |
| 74C02 | .29 | 74C175 | .79 |
| 74C04 | .29 | 74C221 | 1.49 |
| 74C08 | .35 | 74C240 | 1.29 |
| 74C10 | .35 | 74C244 | 1.29 |
| 74C14 | .49 | 74C373 | 1.49 |
| 74C32 | .35 | 74C374 | 1.49 |
| 74C74 | .59 | 74C912 | 7.95 |
| 74C85 | 1.39 | 74C915 | 1.39 |
| 74C86 | .35 | 74C920 | 9.95 |
| 74C89 | 5.19 | 74C921 | 9.95 |
| 74C90 | .99 | 74C922 | 3.95 |
| 74C154 | 2.95 | 74C923 | 3.95 |
| 74C173 | 1.05 | 74C925 | 5.95 |

## LINEAR

| | | | |
|---|---|---|---|
| DS0026CN | 1.95 | LM1458N | .39 |
| TL074CN | .89 | LM1488N | .49 |
| TL084CN | .99 | DS14C88N (CMOS) | 1.19 |
| AF100-ICN | 8.95 | LM1489N | .49 |
| LM307N | .45 | DS14C89N (CMOS) | 1.19 |
| LM309K | 1.25 | LM1496N | .85 |
| LM311N | .45 | MC1648P | 4.95 |
| LM317T | .79 | LM1871N | 2.95 |
| LM318N | .99 | LM1872N | 2.95 |
| LM319N | .99 | LM1896N-1 | 1.59 |
| LM323K | 3.95 | ULN2003A | .99 |
| LM324N | .39 | XR2206 | 3.95 |
| LM338K | 4.95 | XR2211 | 2.95 |
| LM339N | .39 | XR2243 | 1.95 |
| LF347N | 1.79 | DS26LS29CN | 4.49 |
| LM348N | .69 | DS26LS31CN | 1.19 |
| LM350T | 2.95 | DS26LS32CN | 1.19 |
| LF351N | .39 | DS26LS33CN | 1.95 |
| LF353N | .49 | LM2901N | .49 |
| LF355N | .79 | LM2907N | 2.49 |
| LF356N | .79 | LM2917N (8 pin) | 1.55 |
| LF357N | 1.09 | MC3419CL | 9.95 |
| LM358N | .49 | MC3446N | 2.95 |
| LM360N | 2.19 | MC3450P | 2.95 |
| LM361N | 1.79 | MC3470P | 1.95 |
| LM380N-8 | .99 | MC3471P | 4.95 |
| LM386N-3 | .99 | MC3479P | 4.79 |
| LM387N | .99 | MC3486P | 1.69 |
| LM393N | .39 | MC3487P | 1.69 |
| LM399H | 2.95 | LM3900N | .49 |
| LF411CN | .79 | LM3905N | 1.19 |
| TL497ACN | 2.69 | LM3909N | .99 |
| NE540H (C540H) | 2.95 | LM3914N | 1.95 |
| NE555V | .29 | LM3916N | 1.95 |
| XR-L555 | .75 | NE5532 | .89 |
| LM556N | .49 | NE5534 | .69 |
| NE558N | .89 | 7805K (LM340K-5) | 1.29 |
| LM565N | .99 | 7812K (LM340K-12) | 1.29 |
| LM567V | .69 | 7815K (LM340K-15) | 1.29 |
| NE592N | .89 | 7805T (LM340T-5) | .49 |
| LM741CN | .29 | 7812T (LM340T-12) | .49 |
| LM747CN | .59 | 7815T (LM340T-15) | .49 |
| MC1350 | 1.49 | 7905K (LM320K-5) | 1.35 |
| MC1372P | 2.49 | 7905T (LM320T-5) | .59 |
| MC1377P | 4.95 | 75472 | .99 |
| MC1398P | 8.95 | 75477 | 1.29 |
| LM1414N | 1.29 | 76477 | 5.95 |
| | | MC145406P | 2.95 |

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|---|---|---|---|
| 8 pin LP | .11 | 8 pin WW | .59 |
| 14 pin LP | .12 | 14 pin WW | .65 |
| 16 pin LP | .13 | 16 pin WW | .69 |
| 24 pin LP | .25 | 24 pin WW | 1.19 |
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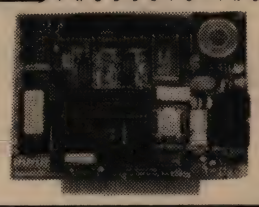

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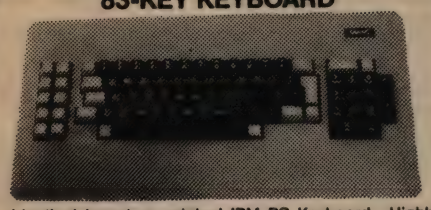

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**Universal 64K/256K Printer Buffer**

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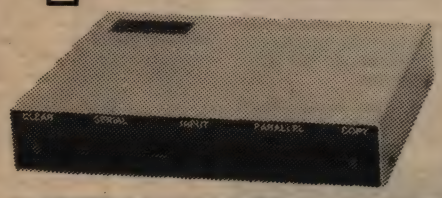

The UBUFFER Universal Printer Buffer is a hi-speed data buffer that accepts data at a high rate, and then outputs this data to your printer. You save valuable computer time. The UBUFFER can be connected to practically any computer or printer. There are four possible combinations: 1) Serial to Serial, 2) Serial to Parallel, 3) Parallel to Parallel, 4) Parallel to Serial. Manual included. Size: 9-1/3"L x 4⅛"W x 1½"H

UB64K. . . . . $199.95
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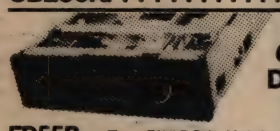

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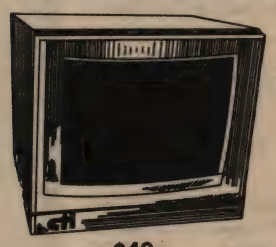

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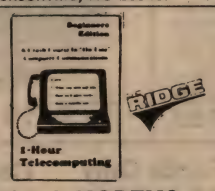


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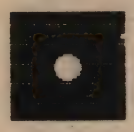

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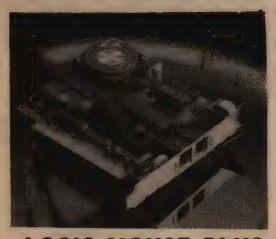

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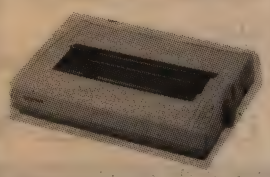

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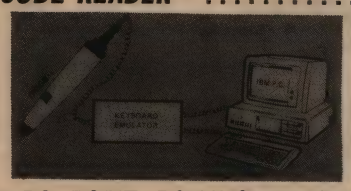

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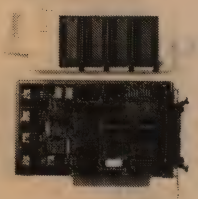

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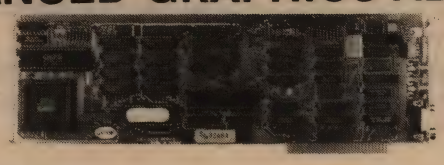

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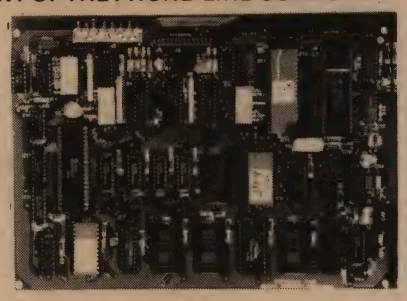

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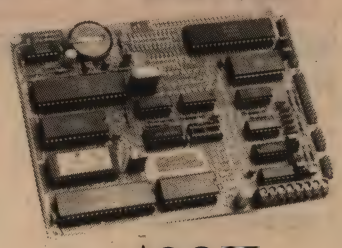

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- 20 Meg

**$389**

- Half height hard disk
- 30 Meg w/RLL controller

**$459**

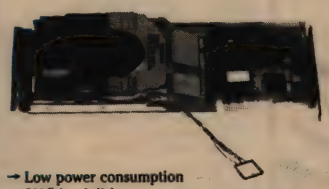
### For IBM AT™

- 40ms access time
- Full height hard disk
- Cables, mounting rails, and manual
- Boots from hard disk
- Uses AT controller (not included)

20 Meg Seagate for AT— **$529**

30 Meg Seagate for AT— **$629**

## 20 MB Hard Disk Drive on a Card



- Low power consumption
- 3½" hard disk
- Western Digital controller
- Easily installs in minutes

**$395**

## EGA Card

- 640x350, 16 colors
- 100% compatible with IBM EGA™ Card

**$229**

## MonoGraphics Card

- 720 x 348 resolution
- Hercules compatible
- Parallel port
- Serial port available as an option

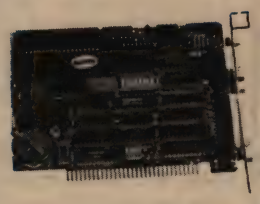
**$89**

## Multifunction Card

- OK expandable to 384K
- Parallel port
- Serial port
- Clock/calendar

**$99**

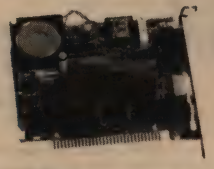
## I/O Card



- Game port
- Parallel port
- Serial port (2nd optional)
- Clock/calendar

**$75**

## Internal Modem



- 300/1200 Baud
- Fully Hayes compatible
- Built-in speaker

**$119**

**External Modem $139**

## Floppy Disk Drive

- Half Height
- DS/DD
- Black or AT gray

**$95**

## AT Multifunction Card

- OK expandable to 1.5 MB
- Parallel port
- Serial port (2nd optional)

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|---|---|
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| LQ-1000 | $759 |
| FX-286 | $575 |
| FX-85 | $395 |

## HERCULES®

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|---|---|
| Color Graphics Card w/parallel port | $155 |
| Monochrome Graphics Card | $195 |

## MITSUBISHI® ELECTRONICS

EGA Monitor ..... **$449**

- 5160 AT Style Keyboard
- Made in USA

**$59**

## intel®

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| 8087-2 | $149 |
| 80287-6 | $195 |

## Hayes®

### Smartmodem

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| 1200B | $339 |
| 2400 | $695 |

## AST® RESEARCH INC.

| | |
|---|---|
| AST Advantage!™ w/128K | $395 |
| AST RAMpage!™ w/256K | $259 |
| AST SixPak™ w/384K | $189 |

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### IBM PC-XT

- 256K RAM
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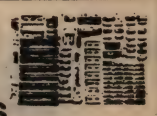

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- Pheonix ROM BIOS
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| 10 meg drive only | $269.00 |
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*40 Track Disk Drives All Half-Height*

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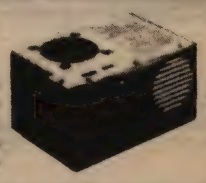
| Okidata GM33158 | $79.75 |
| Tandon 50-2 | $79.95 |
| Fujitsu, TEAC, or Panasonic | $89.75 |
| 1.2 Meg TEAC | $129.75 |

## POWER SUPPLIES



| | |
|---|---|
| 135 Watt | $65.00 |
| 150 Watt | $75.00 |
| 200 Watt/AT | $119.00 |
| IBM PC-JR | $19.95 |
| Atari | $9.75 |

## EXTERNAL DRIVE CASE & POWER SUPPLY

- 75 W Power Supply
- Drive Power Connect.
- Holds 2 HH or 1 FH drive

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## DIMEMSION EXT. POWER SUPPLY FOR DISC DRIVES
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| NEC Multisync Ultra hi-res. EG Color | $599.00 |
| Samsung Monochrome TTL | $89.75 |
| Samsung Composite | $69.75 |
| Thompson RGB 560-240 Res. | $295.00 |
| Thompson RGB 640-240 Res. | $395.00 |
| Texas Instrument High Res Composite Video | |
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Did you buy a clone machine and didn't get any kind of operations manual? We put together an extensive manual that tells you how to hook everything up, how it works & trouble shooting techniques. Covers both XT and Turbo-XT systems. Complete w/schematics.....$24.95
AT Clone Manual.....$24.95
BPS Business Graphics Program for IBM w/charts & software in 2 volumes.....$24.75

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- Complete RAM Test
- Tests Full Memory
- Each Bank
- Each Bit
- Single Chip

**$24.95**

## RAM TEST PROGRAM

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| FDC-502 | Floppy disk controller w/cable—4drives | $44.75 |
| FDC-507 | Floppy Cont. w/serial, parallel & clock | $89.75 |
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| VID-408 | Hi-Res mono/graphics w/printer port Hercules compatible | $79.75 |
| SIO-250 | Serial port card (second serial opt.) | $35 |
| SIO-251 | Serial Port Card w/2 Serial Ports | $44.75 |
| PIO-255 | Parallel printer card | $26.75 |
| MFC-100 | Multi-funct. w/para., ser., clk/cal & 384K Exp. no mem. installed, Software | $90 |
| MFC-120 | 576K memory expansion board | $59 |
| HDC-516 | Floppy & HD controller board for AT W. Dig. | $225 |
| MFL-150 | 1.5 MB Multifunctional board with serial, parallel, game port for AT | $269 |
| VID-425 | Enhanced Graphic Adapter w/256K, parallel printer port by Everex | $249 |
| MDC-517 | Adaptec Board 2070A RLL HD controller. Format STD 20 Meg drive to full 30 Meg | $169.75 |
| VID-402 | Color graphics card w/ printer port By Zucker | $89 |
| VID-409 | Hi-res Zucker monographic card w/printer port 640K RAM built in | $89.75 |
| VID-410 | Hercules Compat., mono graphics, serial/parallel ports, game, RTC cal | $155.00 |

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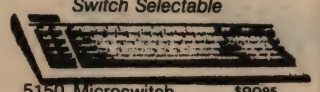
*For AT or XT*
*Switch Selectable*



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|---|---|
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| Maxi Switch AT/XT | $59.75 |
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**$699**
- Intel 8088-2 (4.77 & 8 mHz)
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- 20 Meg hard drive
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- 640K RAM

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- Internal 1200 Baud Modem
- 640K RAM

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| 2532 | $4.75 | 27128 | $4.95 |
| 2732 | $4.25 | 27256 | $5.95 |

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| 256K Set of 9 | $26.75 |
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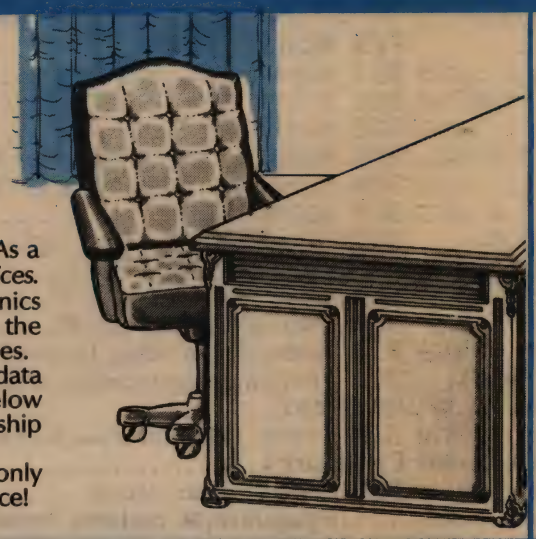

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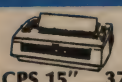

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WORDSTAR 2000+ .....299.
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HAYES 300 FOR IIc w/SFTWR .....169.
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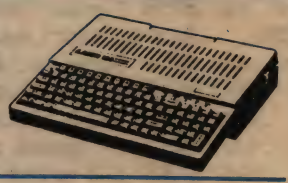

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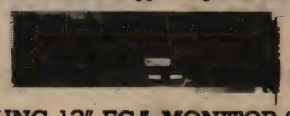

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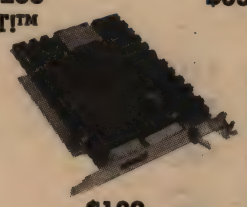

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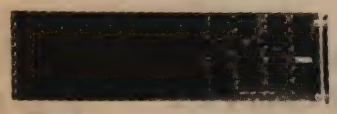

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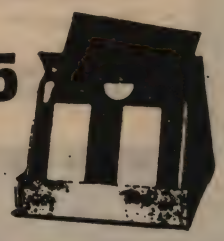

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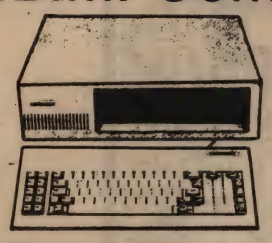

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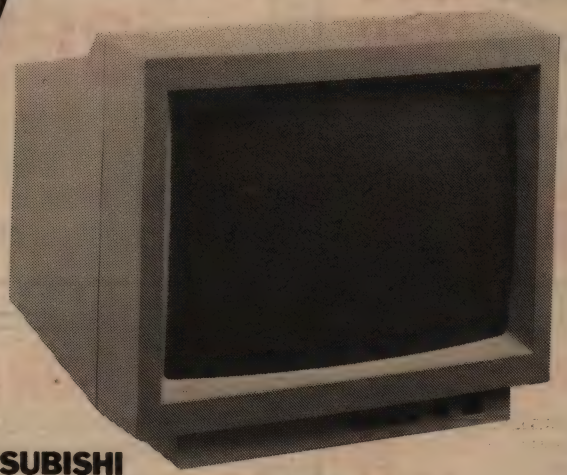

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# HDtest
BY GALLERY 6

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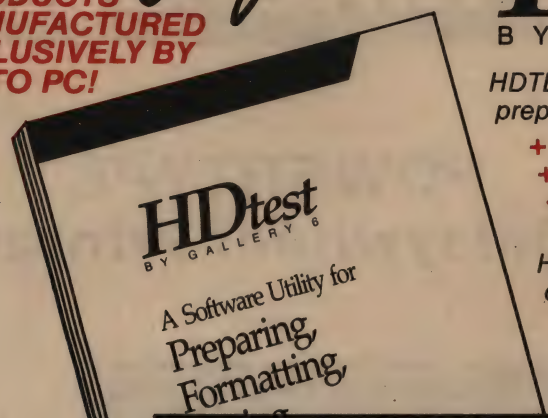


*HDTEST is a menu-driven software utility for preparing, testing, and low-level formatting of hard disk drives. Features include:*

- *Formatting and sophisticated error detection*
- *Load and save: drive and test parameters, bad track data*
- *Works with Auto-config*
- *Prints out test summaries*

**$99**

*HDTEST will run on IBM PC, XT, AT, and true compatibles with a monochrome or color card under PCDOS versions 2.0, 2.10, or 3.10. Supported disk controllers include Western Digital, OMTI, Xebec, Data Technology (DTC), and Adaptec.*

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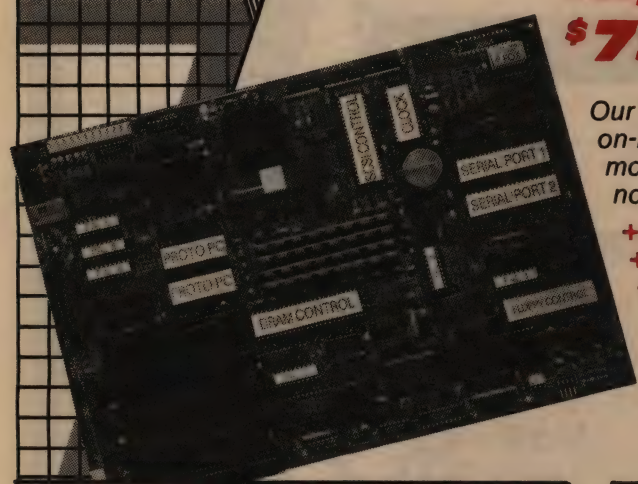


*Our basic system includes the X16 motherboard with 1024K, case, power supply, keyboard, and many on-board functions including clock/calendar and floppy controller. Then add your choice of drives, monitors and cards to meet your needs. The fully XT compatible X16 motherboard combines technology, power, and reliability for a top-performance computer. Place your order today!*

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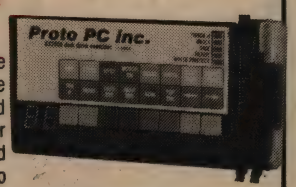
## EX2000 FLOPPY DISK EXERCISER




Here's the ultimate ten minute exercise for floppy drives. Use EX2000 with alignment disk and oscilloscope to align and repair any floppy drive with a standard interface. Includes variable step rate, single keypress to any alignment track, hysteresis and speed tests. And now you can get the optional APL2 Adapter, for testing single and dual Apple II type drives. Other options include cable sets and alignment disks for 3½", 5" or 8" drives. Order today!

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*Sincerely,*

*Mark L. Runkle*
*President*

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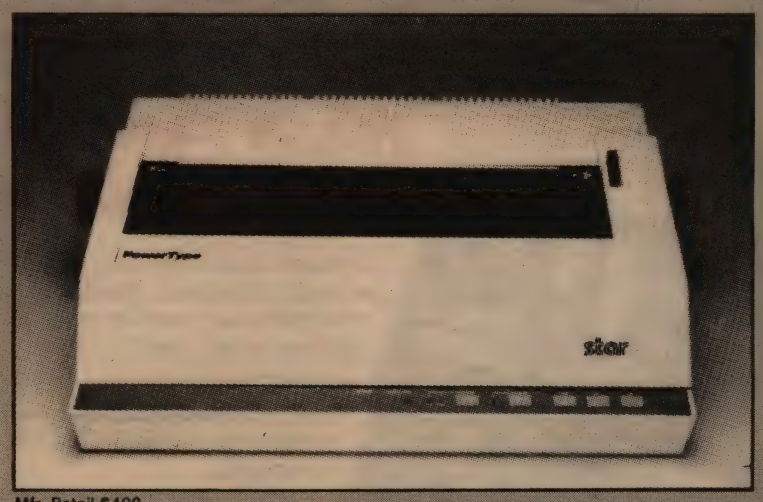
## POWERTYPE Daisywheel Printer

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- Fast 18 cps Print Speed
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- Short Form Tear-Off
- 1 yr. Warranty
- Nationwide Service by Honeywell

**Now Only $249**

Buy 2 at **$239** Each
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For crisp, executive quality correspondence here is the opportunity you've been waiting for. Get your PowerType Daisywheel Printer by Star Micronics from MidWest Micro at an unbeatable low price. The PowerType gives you bi-directional printing at a brisk 18 cps. Standard EPSON and Qume codes make it adaptable to virtually all personal computers. It lets you choose a print pitch of 10, 12, or 15 CPI and also offers both parallel and serial interfaces standard. Other special features of the PowerType include: proportional spacing, 32 easy access format switches, short form tear-off and skip over perforation. PowerType is also "typewriter friendly" using a simple drop-in ribbon cassette and Diablo printwheels which saves you time and money. So no matter what your printing needs are, the PowerType from MidWest Micro is the printer for your office or home.

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| NL10 | $229 | SR10 | $469 |
| NX15 | $359 | SR15 | $559 |
| SG15 | $359 | NB15 | $899 |

Gemini 10X $179

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# Confused About Monitors?

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Phone (513) 663 5488

*Friends,*

*It seems that there is a bit of confusion surrounding monitors and their selection. This is especially true of color monitors. How many colors? What horizontal by vertical resolution? Can I get a really good color monitor for less than $350?*

*In order to give you the right monitor at the right price, we had to first determine what was the main quality in a monitor for comparisons. As it turns out, the actual distance from the center of one dot to the next or "dot pitch" is the best parameter to compare. The "dot pitch" determines the continuity of your characters and graphs.*

*Secondly we had to find a manufacturer of outstanding quality and integrity who makes a major portion of the monitors for well known "name brand" product lines. A monitor is a precision instrument and no Johnny-Come-Lately would do.*

*After a thorough search, we found that by making a large commitment we could bring to you a premier product at a bargain price.*

*So whether you need one or one hundred quality computer monitors, call us now and do yourself a favor. Experience quality and affordability with Goldstar Computer monitors.*

*Sincerely,*
*Mark Runkle*
*President*
*MidWest Micro*

***Let MidWest Micro and Goldstar clear up your confusion and rescue your computer equipment budget.***

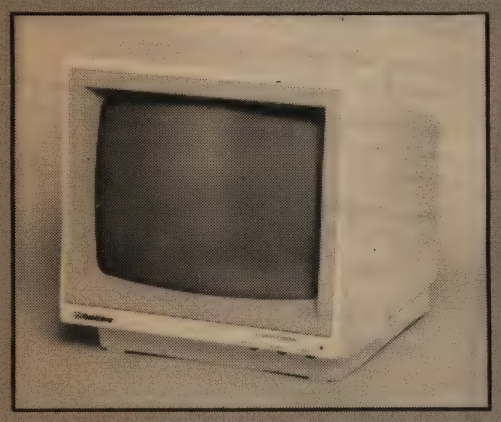
## MONOCHROME VIDEO MONITORS

Acknowledged as superior, Goldstar Monochrome Video Display Monitors offer a wide selection, a wide array of features and are designed for the great variety of applications required by business and personal use. Extensive video experience has resulted in monitors of sleek design, rugged dependability and extraordinary quality. Goldstar monitors are unsurpassed in value and performance.

### MBM-2233

List $159 Just **$69**

A high-resolution, 12" monitor, the 2233 is compatible with a wide variety of micro computers. The resolution of 900 lines at center and non-glare screen combine to significantly reduce eyestrain. The sharp, high quality, amber display can contain 25 lines of 80 characters per line. It features a loop-through circuit for chaining multiple monitors, and accepts a composite video input signal via an RCA phono pin jack.



### MBM-2015

Just **$99** green Just **$109** amber

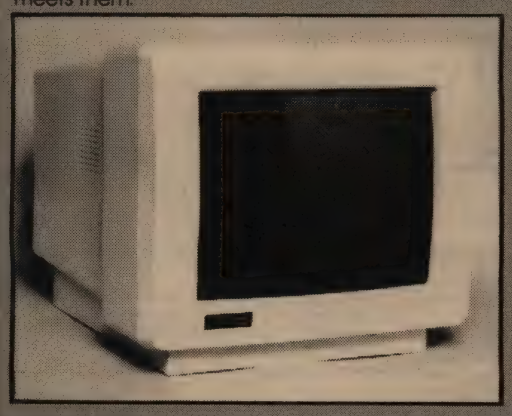
This 12" display monitor is designed for IBM PC and other PC compatibles. The high resolution of 900 lines at center provides excellent character definition. Complemented by a non-glare, high contrast screen, the 2015 is easy on the eyes and excellent for extended viewing. The separate ttl input signals are accepted via a 9-pin connector, the standard connection to the IBM monochrome display card.

**SWIVEL STAND ..... $14.95**
Get your Swivel Monitor Stand for 12" Monitors for this Low, Low introductory Price.

## COLOR VIDEO MONITORS

Goldstar color video display monitors provide the enhanced performance required of today's personal and business micro computers. High resolution, vivid image displays are suitable for the most demanding applications. The medium resolution display monitor provides sharp, clear characters and graphic elements. These monitors are designed to minimize eyestrain by eliminating glare. Goldstar color monitors are compatible with a wide variety of personal computers and video systems.

Image stability, depth-of-color and picture clarity are the performance objectives. Goldstar meets them.



### MCM-4035

List $549 NOW **$279**

The 13" MCM-4035 delivers superior value. The medium resolution color display creates a very sharp image. Sixteen colors are produced on the anti-glare screen and up to 2,000 characters fit on the display. High reliability combines with high quality image production to make it a flexible, multi-purpose color monitor for most micro computer applications. The 4035 accepts RGB direct drive input, and, the controls are located behind the front panel for both easy access and clean, aesthetic appeal.

### MCH-4015

NOW **$319**

The 13" MCH-4015 delivers the extra sharp, high resolution quality images demanded by presentation graphics. Top-of-the-line performance combines features such as an anti-glare screen and 31-mm dot pitch to provide continuous, easy viewing. It accepts RGB direct drive input, and, the controls are located behind the front panel for both easy access and clean, aesthetic appeal to compliment any work area.

**CGA-Compatible Monitors: Summary of Features**

| Manufacturer | Model | List Price | Screen Size | Dot Pitch | Horiz Freq | Vert Freq |
|---|---|---|---|---|---|---|
| Amdek | Color 600 | $599 | 13 | 0.43 | 15.75 | 60 |
| Amdek | Color 710 | $699 | 13 | 0.31 | 15.75 | 60 |
| IBM Corp. | Color | $680 | 13 | 0.43 | 15.75 | 60 |
| Princeton Graphics | HX-12 | $695 | 11.5 | 0.31 | 15.70 | 60 |
| Thomson Products | CM36382Si | $529 | 14 | 0.38 | 15.70 | 60 |
| Wyse Tech. | WY-620 | $545 | 13.5 | 0.43 | 15.75 | 60 |
| Goldstar | MCM-4035 | $549 | 13 | 0.43 | 15.75 | 60 |
| Goldstar | MCH-4015 | $659 | 13 | 0.31 | 15.75 | 60 |

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**CALL FOR PROFIT PRODUCING PRICES ON THESE HIGH QUALITY GOLDSTAR PRODUCTS.**

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# MidWest Micro-Peripherals

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*All equipment shipped factory fresh with manufacturers warranty*

***HIGH TECHNOLOGY — NOT HIGH PRICES***

# Best Business Printer Buys In U.S.

## 420 CPS COMREX CR-420 Business Printer MOVES MOUNTAINS

**MidWest Micro-Peripherals**

*Friends,*

*MidWest Micro has landed for you two of the best continuous duty, business quality printers anywhere. And the values absolutely cannot be beat! Through special arrangements we are able to offer a limited quantity of Comrex CR-4 daisywheel and CR-420 high speed dot matrix printers at unbelievable savings.*

*These printers are new in factory containers and come to you complete with manufacturers warranty.*

*Again this is a limited offer and will not be repeated. So call now and "Save with Confidence" to the tune of several hundreds of dollars.*

*We at MidWest Micro will continue to do our best for you. Thank you for your generous patronage.*

*Sincerely,*

*Mark L. Runkle*
*President*

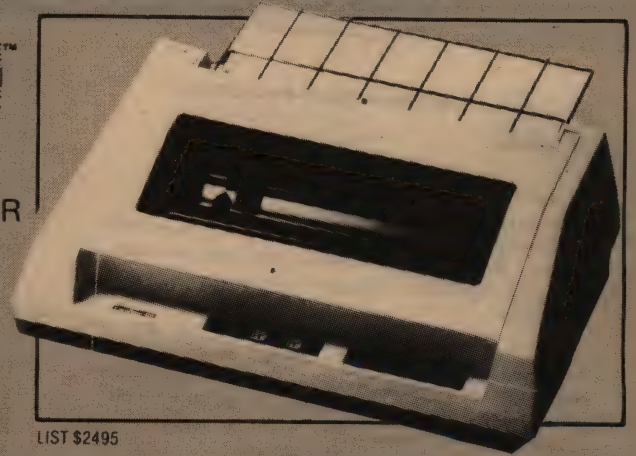
COMREX™

**CR-420**

NOW WITH IBM PRINTER EMULATION!

JUST

**$895**



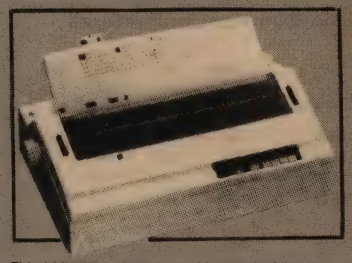
LIST $2495

This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

**SPECIFICATIONS**

**Carriage Width:** 132 Columns (at 10 pitch)
**Print Method:** Impact dot matrix, bidirectional, logic seeking in both text and graphics
**Print Speed:** 420 CPS/Draft; 104 CPS/Correspondence Quality, 2500 dots/sec. – standard graphics; 1250 dots/sec – high-density graphics
**Print Head:** 8-pin, staggered arrangement
**Character Sets:** Standard 96 ASCII printing in 17 fonts
**Line Spacing:** n/180 (n=0-255)
**Paper Feed:** Pin feed (paper width adjustable) and built-in friction feed
**Paper Width:** 5" to 15" (pin feed); Up to 16" (feed)
**Paper Path:** Rear and bottom entry
**Paper Thickness:** Original plus 4 copies (5-part)
**Ribbon:** Cassette style, single color (black)
**Interfaces:** Parallel – Centronics-style; and Serial –RS232C Asynchronous
**Baud Rate:** 1200, 2400, 4800, 9600; switch selectable
**Protocols:** X-ON/X-OFF, READY/BUSY, ETX/ACK, switch selectable
**Buffer:** 18K
**Reliability:** MTBF – 800 hours continuous printing; MCBF – 200 million characters; MTTR – 30 minutes
**Power:** 117 VAC ± 10%, or; 220 VAC ± 10%, 50/60 $H_z$
**Power Consumption:** 55W (Standby); 175W (Operating at self test print); 250W (Operating at heaviest duty)
**Environmental Limits:** Temperature (operating) 5°-40°C; 40°-105°F; Humidity (operating) 20-80%
**Dimensions:** 595mm (W) x 194mm (H) x 405mm (D); 23.4" (W) x 7.6" (H) x 15.9" (D)
**Weight:** 27kg; 60 lbs.

**Extra Long CR 420 Ribbon Cartridges $16.95 6+ $14.50**



COMREX™

**CR-4**

Your Price Just

**$399**

Was $1995

**2+ $369**
**3+ $349**

- **Superior Performance**
- **Fast 36 CPS Print Speed**
- **7K Print Buffer**
- **Continuous Duty Cycle**
- **Wide 16-5" Paper Carriage**

This bidirectional, logic seeking marvel lets you adjust the hammer intensity to print anything from single-page letters to five-part forms with equal clarity. A variety of impressive typestyles give you added print versatility.

It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

**Quiet quality.**
What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

**Specifications**

| | |
|---|---|
| Print Speed | 36 CPS (Shannon text) |
| Print Wheel | 96 petals/wheel, cassette type, ASCII stand |
| Print Wheel Life | 10 million char./wheel |
| Characters/Line | 132 characters (1/10"), 158 characters (1/12"), 198 characters (1/15") |
| Paper Width | 16.5 in max (419 mm) |
| Copy Capacity | Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.) |
| Carriage Motion | Bidirectional, logic seeking |
| Carriage Rtrn Speed | 750 ms (at 13.2" return) |
| Line Spacing | 6, 4, 3 lines/inch, 1/48" proportional increments |
| Paper Feed | Bidirectional, logic seeking |
| Paper Feed Speed | 4"/second |
| Available Ribbons | Ribbon Life |
| Single-strike black carbon film | 60,000 |
| Multi-strike black carbon film | 150,000 |
| Single-strike black correctable film | 70,000 |
| Multi-strike black fabric | 500,000 |
| Single-strike red film | 2,000 |
| Correction tape | 1,500 |
| Interface | Standard RS-232C – Serial |
| Buffer Size | 7K |
| Control Panel | Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs)<br>Switches: Select, Line Feed, TOF, Line, Pitch, and Copy |
| Noise | Operating – Less than 65 dB |
| Temperature | 50 to 105 F – 10 to 40 C (operating) |
| Humidity | 20% to 80% non-condensing (operating)<br>5% to 90% non-condensing (storage) |
| Power | 120 V, 60 Hz (Optional: 120 or 220 - 240 V, 50/60 Hz) 130 W Max. |
| Dimensions | 21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm) |
| Weight | 33 lbs (15 kg) |
| Optional Features | Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles) |

VISA MasterCard AMERICAN EXPRESS

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# SEIKOSHA MEANS BUSINESS

## SAVE WITH CONFIDENCE – CALL MIDWEST MICRO

NO TAX CHARGED TO RESIDENTS OUTSIDE OHIO
SAME DAY SHIPPING ON ALL ITEMS IN STOCK
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**PRICE GUARANTEE**
We at MidWest Micro guarantee that we can save you up to 69% or more on your purchase of new fully warranteed equipment and supplies. And we will still give you friendly, courteous service. Call today and Save With Confidence!

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800-528-4504

**MidWest Micro-Peripherals**
135 South Springfield Street Saint Paris Ohio 43072
Phone (513) 663 5488

*Friends:*

*The latest opportunity for you to increase your office productivity is with the complete line of Seikosha printers. Seikosha's are made with the same precision and durability you have come to expect from the quality leader in the watch industry – Seiko. Seikosha is also the sister company of the largest microcomputer printer manufacturer in the world – Epson. With this great Seikosha heritage and MidWest Micro's dedication to giving you quality equipment at the most competitive pricing, we offer you these three great business quality printers.*

*The BP-5200I with its fast 200 cps throughput in draft and 103 cps in correspondence mode will speed up almost any small to medium business operation. The BP-5420AI is a super high performance business application printer. It offers great speed at 420 cps, excellent quality output, and rear and bottom paper feed. The BP-5420AI compares across the board with the Epson 420I and even uses the same ribbon cartridge.*

*Finally, we offer you the best possible value in a high-speed business printer with a low-cost color option. The MP-1300AI is the sister-in-law to the Epson EX-800 but beats it hands down when compared feature for feature. For example, the MP-1300AI prints at 300 cps in draft pica while the EX-800 is only 250 cps, the MP-1300AI offers both rear and bottom paper path with the EX-800 being only rear, and the MP-13000AI gives you a 10k print buffer as opposed to the EX-800 with its 8k print buffer.*

*Seikosha outperforms the competition where it counts and even has a two full year warranty. Call MidWest today for the solution to your business printer needs.*

*Sincerely,*

*Mark L. Runkle*
*President*

## SEIKOSHA

There's Quality in Our Name
Hattori Seiko Computer Peripherals

***Let MidWest Micro improve your office productivity with a reliable Seikosha Business Printer - All backed by a 2 Full Year Warranty.***

***Reduce the processing time of a large volume of business data to an incredible minimum with . . .***

## SEIKOSHA 1300AI

Only **$499** List $799

- High Speed Printing (300 cps) with Minimum Noise
- Superb NLQ Printing (50 cps)
- 47 lpm Throughput (Draft)
- Variety of Characters and Graphics
- Both IBM and EPSON Compatible Printer Emulation Modes
- Built-in Parallel and Serial Interfaces
- Auto Paper Loading and Ejection
- Downloadable Character Settings
- Front Panel Margin Setting
- Built-in 10k Print Buffer
- Both Rear and Bottom Paper Path
- Easy-to-Handle 7 Color Printing Kit (optional)
- 2 Full Year Warranty

**SEIKOSHA MP-1300AI BEATS EPSON EX-800 Feature for Feature**

- Seikosha has a 2 Full Year Warranty instead of Epson's 1 Year
- MP-1300AI prints at 300 cps in draft pica while EX-800 is only 250 cps
- MP-1300AI has both rear and bottom paper path while the EX-800 has only rear
- MP-1300AI gives you a 10k Buffer as opposed to an 8k on the EX-800

**ATTENTION DEALERS**

Call our Dealer Hot Line to improve your profits and competitive status.
**Call 800-528-4504 In Ohio Call 800-222-6571**

***An ideal innovation for small business . . .***

## SEIKOSHA BP-5200I

Just **$469** List $1049

- High Speed Draft Mode at 206 cps
- Correspondence Mode at 103 cps
- Extremely Low Noise Level
- Built Sturdily for Extra Heavy Duty Use
- All IBM PC Characters and Graphic Elements
- 4k Built-in Print Buffer
- Uses Paper up to 15.5" Wide
- Rear and Bottom Paper Path
- Automatic Cut Sheet Feeder Optional
- 2 Full Year Warranty

***Bring the true value of high speed performance to your office with . . .***

## SEIKOSHA BP-5420AI

Only **$1059** List $1849

- 420 cps Maximum Print Speed
- High Quality Correspondence Printing at 104 cps
- IBM and EPSON Mode Selectable
- Built-in 18k Print Buffer
- Both Parallel and Serial Interfaces
- Pin Feed and Friction Feed Standard
- Handles Paper up to 15.5" Wide
- Eight Language Fonts with DIP Switch Selector
- Heavy-Duty Construction
- Automatic Cut Sheet Feeder Optional
- Rear and Bottom Paper Path
- 2 Full Year Warranty

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*Fellow Computer Users,*

*Through special arrangements we have been authorized to offer you one of the most popular printers of all time at a "give away" price. Yes, we've sold thousands of the ever popular Gemini 10X printers at nearly twice the price. The 10X is a great choice for both business and home applications. Those already using our Star Gemini 10X's include about everyone from Bell Labs to my brother's kids.*

*I'm absolutely delighted to be able to offer you this durable and versatile printer for only $179. And you can expect the same friendly, courteous service both before and after the sale plus full warranty care from MidWest Micro.*

*Our supply is limited and they can't last long at this unbelievable price. So call today and get the buy of the year!*

*Sincerely*
*Mark L. Runkle*
*President*
*MidWest Micro*

COMPUTER SHOPPER Best Buy OF THE YEAR

star micronics · inc
Buy from the nations largest Direct Authorized Star Micronics Dealer and Service Center

*NOW you can get the most printer for your dollar with. . .*

## Gemini 10X

NOW ONLY
**$179**
LIST $399

If you are looking for a top quality printer at an affordable price, you've found both in the Gemini 10X. The Gemini 10X operates bi-directionally at 120 cps. It switches from standard 80 column printing to 132 column condensed and 96 standard ASCII characters. This gives you the capabilities to do everything from recipes to spreadsheets. The character matrix offered includes the descenders, emphasized, double strike, block graphics and hi and low bit image graphics. These features give the Gemini 10X versatility enough for use in your home or office. The Gemini 10X also features a buffer expandable to 8K that lets you continue to work – not waste your time waiting on your printer. Breakdowns? Virtually unheard of with the Gemini 10X – with a print head life of over 100 million crisp, clean characters. The Gemini 10X comes complete with both friction and adjustable tractor feed. It even includes a free roll paper feed mechanism for greater economy.

**Quantity Purchasing** Buy 3+ @ $169 ea.
6+ @ $159 ea.
25+ *$CALL$*

## Complete star Gemini 10X PRINTER PACKAGE

**From MidWest Micro**

JUST **$219**

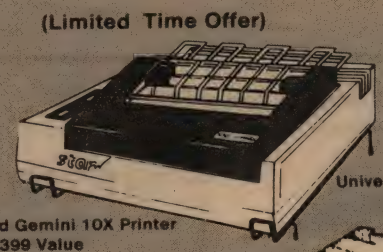
(Limited Time Offer)

Save $314

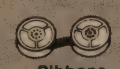
Printer Package Includes:

1. Full Featured **star Gemini 10X Printer**
2. A **Universal Printer Stand** which tilts printer toward you for easy access and creates space for organizing paper
3. Attractive Heavy-Duty vinyl **Printer Cover** – anti-static and anti-dust
4. Plenty Pack of 20# bond clean-edge fanfold **Paper**
5. 2 Super length **Ribbons** for Gemini 10X
6. Full **1 year Warranty** parts and labor
7. Free use of MidWest Micro's Customer **Support Hot Line** (513-663-4992)

**Quantity Purchasing** 3+ $209 6+ $199

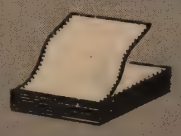


Full Featured Gemini 10X Printer $399 Value

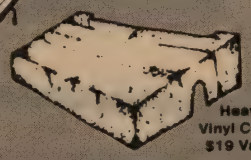


Ribbons $18 Value

Universal Printer Stand $49 Value



Paper $29 Value



Heavy-duty Vinyl Cover $19 Value

## Complete star Line. . .

The star printer line includes a number of fast, efficient and cost effective models. Call MidWest Micro and let us help you select one today!

| | List | |
|---|---|---|
| SD-10 (160 cps, 80 Col, NLQ Mode) | $499 | *319 |
| SD-15 (160 cps, 132 Col, NLQ Mode) | 599 | *429 |
| NX-15 (New, 120 cps, 132 Col, NLQ) | $CALL$ | |
| LV-1210 (120 cps, 80 Col, IBM Mode) | $299 | $CALL$ |
| SR-10 (200 cps, 80 Col, NLQ Mode) | $649 | 469 |
| SR-15 (200 Cps, 132 Col, NLQ Mode) | 799 | 559 |
| POWERTYPE DAISYWHEEL | 499 | $CALL$ |

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PAGE 1

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- 100% certified

| | 50+ | 100+ |
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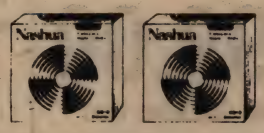
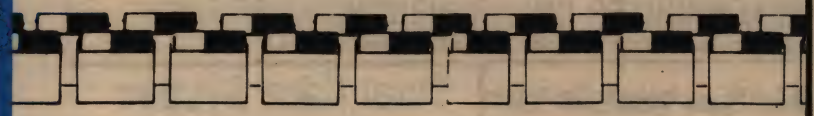
| 3½" DS | 1.85 | 1.79 |
| 5¼" SS/DD | .63 | .57 |
| 5¼" DS/DD | .65 | .59 |
| 5¼" HD | 1.75 | 1.69 |



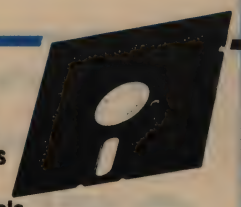


- Packaged in polybags of 50, sold in increments of 250.
- Labels, write protects and envelopes

| | 250+ | 500+ |
|---|---|---|
| 5¼" Single Sided/Double Density | .41 | .39 |
| 5¼" Double Sided/Double Density | .45 | .41 |

## BULK VERIFLEX

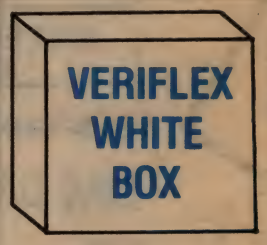
- 100% certified
- Poly-bagged in tens
- Tyvek envelopes
- Write protects, labels



5¼" DS/DD DISKS AS LOW AS . . **28¢** each. (1000+)

31¢ each (500+)

35¢ each (250+)




- In plain white box
- Boxed in tens
- Envelopes
- Labels, write protects

AS LOW AS **35¢**

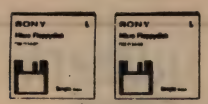
| | 100+ | 500+ | 1000+ |
|---|---|---|---|
| 5¼" DS/DD | .39 | .37 | .35 |
| *NEW* 5¼" HD | 1.35 | 1.25 | call |

- Boxed in tens
- FREE case
- Tyvek envelopes, lables write protects

5¼" DS/DD

| 50+ | 100+ |
|---|---|
| 67¢ | 62¢ |

## SONY

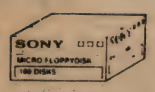


BOXED IN TENS

| | 50+ | 100+ |
|---|---|---|
| 3½" Single Sided | 1.22 | 1.17 |
| 3½" Double Sided | 1.85 | 1.79 |
| 5¼" Double Sided/Double Density | .99 | .95 |
| 5¼" High Density | 2.09 | 1.99 |

## SONY MAC • PAC

Packaged in fifties



| | 50+ | 100+ | 400+ |
|---|---|---|---|
| 3½" Single Sided | 1.19 | 1.15 | 1.09 |
| 3½" Double Sided | 1.63 | 1.58 | 1.53 |

## maxell

3½" SS Disks

Packaged in fifties

| 50+ | 100+ | 400+ |
|---|---|---|
| 1.30 | 1.25 | 1.20 |

BOXED IN TENS

| | 50+ | 100+ |
|---|---|---|
| 3½" DS | 1.95 | 1.89 |
| 5¼" DS/DD | .97 | .93 |
| 5¼" HD | 2.07 | 1.97 |

## 3M

5¼" DS/DD
Boxed in tens

**89¢** each, Qty. 300

95¢ each, Qty. 100
99¢ each, Qty. 50

## Verbatim. DataLife.

| | 40+ | 100+ |
|---|---|---|
| 3½" Single Sided | 1.24 | 1.19 |
| 3½" Double Sided | 1.85 | 1.78 |

5¼" DS/DD
NOW WITH DATAHOLD

| 40+ | 100+ |
|---|---|
| 1.05 | .97 |

**CALL TOLL FREE**

7 to 7 Central Time, 10 to 3 Saturdays

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(1-800-872-3539)

In Illinois 1 800 FOR-FLEX (1-800-367-3539)

MasterCard VISA

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PAGE 2

*Happy Holidays from your friends at....*

# USA FLEX

135 N. Brandon Drive, Glendale Heights, IL 60139

# STOCKING STUFFERS

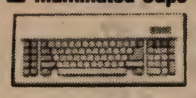
## HOLIDAY SAVINGS

### MOUSE SYSTEMS

MOUSE FOR IBM & Compatibles **$99.00**
While Quantities Last

### Keyboards

- FCC approved
- Illuminated Caps
- Scroll locks
- AT/XT Switchable



**$59.99**

### APPLE IMAGEWRITER COLOR RIBBONS $3.05 EACH

(6-pack contains one each: red, green, blue, brown, purple, yellow).

### 3M DATA CARTRIDGES

| | | | |
|---|---|---|---|
| DC600A | $20.67 | | |
| DC300XL | 18.37 | | |
| DC300XLP | 18.67 | | |
| DC1000 | 12.17 | | |
| DC2000 | $16.67 | DC600XTD | $21.98 |
| DC300A | 15.43 | DC615HC | 17.17 |
| | | DC100A | $11.77 |

### Total Care System

*Contains:* Head Cleaning Kit
Swabs Antistatic spray
Wipes Screen Terminal Cleaner

For 3½" . $12.95 For 5¼" . $9.95

*Head Cleaning Kits*
For 3½" . $7.95 For 5¼" . $5.95

### SURGE SUPPRESSORS

- Normal and common mode suppression
- Low let-thru voltage

**$9.89**

### PC Tool Kit

By: Microcomputer Accessories

**$19.99**

### LETTER QUALITY

**ADEUS CP2000 Printer . . . . . $219.00**

- Memory of 2KB (Expandable to 6KB)
- Fast and Quiet (22 CPS at 58dB)
- Diabolo 630 WP sequence
- Parallel and Serial ports
- Sheet and Tractor feed available

*FREE SHIPPING*

### POWER CENTER

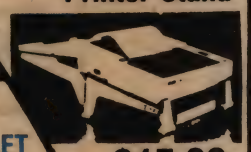
- Upfront, individual switching for up to five devices

**$49.95**

### DECADE II

20 meg cassettes for Genoa and Memtec tape back-up systems. **$9.95**

### CURTIS Printer Stand



**$15.99**

### ROLLTOPS

Genuine Teak
Holds 50
3½" . . . . . $17.49
Holds 50
5¼" . . . . . $24.99
Holds 100
5¼" . . . . . $32.99

Classic design in buff'n oak

3½" model . . . 17.49
5¼" model . . . 24.99

### Spacesaver 2 Monitor Arm

Mounted, adjustable arm for monitor **$65**

### CRT AND TERMINAL VALET

Wall, desk or flange mount **$85**

### A/B SWITCH

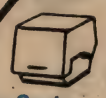
Serial/Parallel
**$24.99**
*ORDER TODAY!!*

### SOFTWARE

| | |
|---|---|
| Wordstar 3.3 | $89.00 |
| BPS Graphics | 14.99 |
| Peachtext 5000 | 49.00 |
| Multiplan | 39.00 |

*Quantities limited!*

### Flip Sorts



Holds 60
3½" disks . . . $5.95
Holds 80
5¼" disks . . . $5.95

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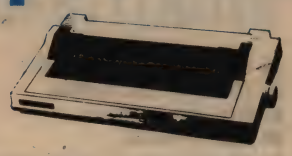
## DOT MATRIX PRINTERS

# 100% Epson

## Compatible

### By Riteman



**Low Profile**
**Wide Carriage**

- 160 CPS correspondence
  32 CPS NLQ
- 132 column
- Tractor feed standard
- All Epson escape codes
- All IBM characters
- 8K buffer-for graphic capabilities

**$359.00**

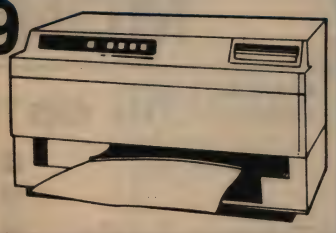
**Portable**

- 120 CPS correspondence
- 80 column
- All Epson escape codes
- All IBM characters
- Pin-feed standard

**$139.00**
$169.00 with tractor feed

## Canon $1949

Laser Printer



- Prints 8 pages per minute
- Automatic cassette or manual feed
- 15 font capability per page
- 8 bit parallel interface

## HEWLETT PACKARD Laserjet $2295

- Includes toner cartridge

| | |
|---|---|
| Laserjet Plus | $3995.00 |
| Laserjet 500 Plus | $4995.00 |
| Emulation Board with purchase of any HP Laserjet | $ 499.00 |

| | |
|---|---|
| Toner Cartridges | $89.00 |
| Font Cartridges | from 189.00 |

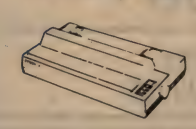
**Hewlett Packard Cartridges**

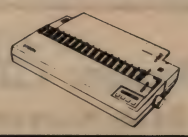
| | |
|---|---|
| Prestige Elite | 184.99 |
| Legal Courier | 272.99 |
| Math TMS | 329.89 |
| Letter Gothic P & L | 272.99 |
| Tax 1 | 329.89 |

*Others available— please call!*

# EPSON PRINTERS

| | | |
|---|---|---|
| FX-286 $488 | LQ-1000 $668 | LX-86 $213 |
| FX-85 $335 | LQ-800 $488 | LQ-2500 $973 |





## RIBBONS sold in sixes

**APPLE IMAGEWRITERS** ..... $2.35

| | |
|---|---|
| **OKIDATA** | |
| 182/192 | 4.50 |
| 84/94 | 2.20 |
| 80/82/92/93 | 1.25 |
| **NEC** | |
| Spinwriter | 5.29 |
| **DIABOLO** | |
| Hytype II | 2.35 |
| **QUME** | |
| Sprint 9 | 2.99 |
| **WANG** | |
| System 5 | 2.29 |
| **C. ITOH** | |
| Prowriter | 2.35 |
| **EPSON** | |
| LQ1500 | 2.99 |
| MX80 | 2.25 |
| MX100 | 3.15 |
| **IBM** | |
| Proprinter | 3.25 |
| **RADIO SHACK** | |
| DMP2100 | 3.99 |
| NCR2140 | 3.39 |
| **STAR MICRONICS** | |
| Radix 15 | 5.49 |
| Radix 10 | 4.49 |
| **TOSHIBA** | |
| 1350 | 3.59 |
| **PANASONIC** | |
| KXP1090 | 5.79 |

## COPY II PC OPTION BOARD

**By: Central Point Software**

The best way to make archival back-ups of protected software!

**$83.00**

- Add-in board
- Gives you same capabilities as most disk duplication firms
- Includes track editor
- Uses one full size slot

## CABLES

| | |
|---|---|
| 6' DB 25-pin male to 36-pin Centronics male D adapts IBM & compatibles to Centronics parallel printer | $11.95 |
| 9' DB 25-pin male to 36-pin Centronics male D adapts IBM & compatibles to Centronics parallel printer | $14.95 |
| 6' Centronics male to Centronics male D for computer to printer | $14.95 |
| 6' RS-232 DB 25-pin male to 25-pin female for use with IBM & compatible printers | $10.95 |

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# USA FLEX

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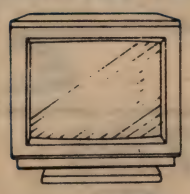
## MONITORS

### SAMSUNG With Tilt'n Swivel



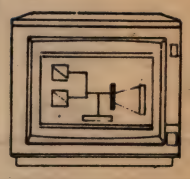
- 12" monochrome TTL
- High resolution
- Amber monitor
- Complete with tilt'n swivel

**$84.00**

### SAMSUNG CGA/EGA

- 14" Dual Frequency
- Resolution 640 × 350
- Dot Pitch .31mm
- 16/64 colors

**$450.00**



### EGA Card

- Made in USA
- Supports 256K
- Parallel printer port
- 1 year warranty

**$279.00**

### SPECIAL OFFER

EGA Monitor and card ..... **$649.00**

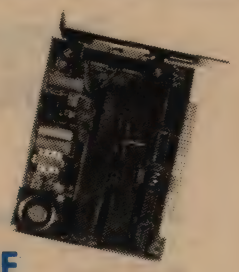
### MAGNAVOX

- RGB, TTL and Composite inputs
- Resolution 640 × 240
- Automatic interpretation of composite or separate sync signal
- Green text display switch
- Vertical/Horizontal/Sharpness controls
- Built-in stand
- Interface cables included

**$259.00**

## MODEMS

### "smalltalk"™ Internal Half Card

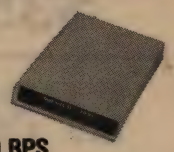


- 100% Hayes compatible
- True short slot modem
- Five year warranty
- Easy to install
- Single keystroke commands throughout
- 18 number dialing table
- Auto-dial to Dow Jones and The Source

**WITH QUICKLINK SOFTWARE**

1200/300 BPS **$105.00** | 2400/1200/300 BPS **$239.00**

### "desktalk" External



- 100% Hayes compatible
- With Quicklink Software

1200/300 BPS **$139.00** | 2400/1200/300 BPS **$279.00**

### INCOMM Turbo External Modem

2400/1200/300 BPS **$329.00**

### KENSINGTON™ MICROWARE

- Portable modem for MAC and Apple
- 300 BPS
- With cable, MAC software

**$49.00**

### ZUCKERBOARD

Color Graphics Card

- Parallel printer port
- Two year warranty
- Made in USA

**$85.00**

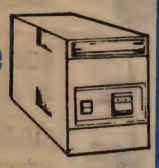
### THESYS FASTCARD III

Extended Memory Card

**$149.95** w/0K

- Split memory mapping
- Automatic memory allocation
- Built-in diagnostics
- Custom password security

### American Power Conversion Uninterruptable Power Supply



Protect your system against EMI, RFI, blackouts, brownouts!!!

- 2 to 3 ms transfer time
- Prevents surges, spikes, noise, interference
- Compact design for use with desktop PC's

330XT ..... $389.00
450AT ..... 589.00

### Seagate Hard Drives

- The only PC hard disk that comes complete with cables, controller, mounting hardware and full and half height bezels in one box.
- Fully tested and warranted for one year.
- Made in USA

**20 Meg Hard Drive** (includes controller card) **$389.00**

**30 Meg Hard Drive** **$549.00**

### MEMTEC

**20 Meg Internal Tape Back-Up**

Compact ..... Low cost
Includes software, cables, controller card, drive and one data cassette.....

**$449.00**

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# THE LATEST IN PC ENHANCEMENT PRODUCTS

## ENHANCED GRAPHICS ADAPTOR

*100% IBM COMPATIBLE—PASSES IBM EGA DIAGNOSTICS*

- ★ COMPATIBLE WITH IBM EGA, COLOR GRAPHICS ADAPTOR AND MONOCHROME ADAPTOR
- ★ DISPLAYS 16 COLORS OUT OF 64 COLORS
- ★ COMES WITH 256K OF VIDEO RAM
- ★ DUAL SCANNING FREQUENCIES WORKS WITH STANDARD OR EGA TYPE RGB MONITORS
- ★ LIGHT PEN INTERFACE

NOW ONLY **$259.95**

## EGA MONITOR

*FULL ONE YEAR WARRANTY*

- ★ EGA AND CGA COMPATIBLE
- ★ SCANNING FREQUENCIES: 15.75 KHz / 21.85 KHz
- ★ 14" BLACK MATRIX, NON-GLARE SCREEN
- ★ RESOLUTION: 640 x 200 / 640 x 350
- ★ .31 DOT, 25MHz
- ★ 16 COLORS OUT OF 64
- ★ TEXT SWITCH-GREEN/AMBER

**$499.95**

BUY BOTH **$699!**

## 20 MB HARD DISK SYSTEM

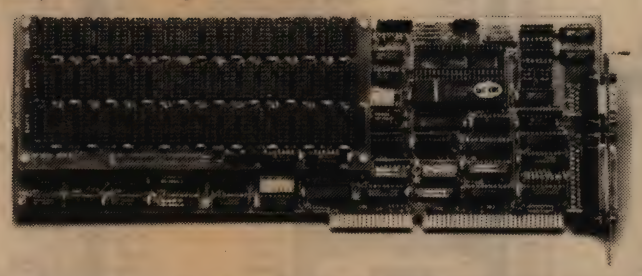
INCLUDES HARD DISK CONTROLLER, CABLES AND INSTRUCTIONS. ALL DRIVES ARE PRE-TESTED AND COME WITH A 1 YEAR WARRANTY.

**$389.95**

## AT MULTIFUNCTION CARD $199.95

*ADDS UP TO 3 MEGABYTES OF USER EXPANDABLE MEMORY*

- ★ SHIPPED WITH ZERO K RAM, USER EXPANDABLE TO 1.5 MEGABYTES RAM ON BOARD, UP TO 3 MEGABYTES WITH OPTIONAL PIGGYBACK CARD
- ★ USES 64K OR 256K DYNAMIC RAMS
- ★ PARALLEL PORT & GAME PORT
- ★ SERIAL PORT
- ★ OPTIONAL SECOND SERIAL PORT

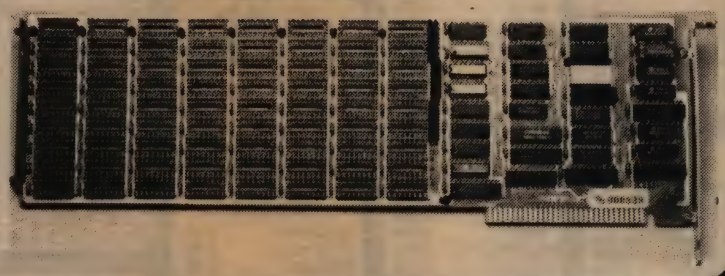


**PIGGYBACK MEMORY CARD** (NO MEMORY INSTALLED) **$49.95**

## EXPANDED MEMORY CARD $199.95

*UP TO 2 MEGABYTES OF LOTUS/INTEL COMPATIBLE MEMORY*

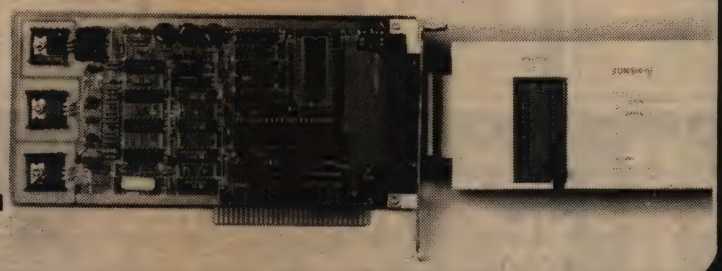
- ★ CONFORMS TO LOTUS/INTEL EXPANDED MEMORY SPECIFICATIONS (EMS)
- ★ SHIPPED WITH ZERO K RAM, USER EXPANDABLE TO 2 MEGABYTES
- ★ USES 64K OR 256K DYNAMIC RAMS
- ★ USE AS EXPANDED (EMS) OR CONVENTIONAL MEMORY, RAMDISK OR SPOOLER
- ★ SOFTWARE INCLUDES EMS DEVICE DRIVERS, PRINT SPOOLER AND RAMDISK



## EPROM PROGRAMMER $129.95

*FOR IBM PC/XT/AT AND COMPATIBLES*

- ★ PROGRAMS 27xxx SERIES EPROMS UP TO 27512
- ★ MENU DRIVEN SOFTWARE PROVIDED ON DISKETTE
- ★ AUTOMATICALLY SETS PROGRAMMING VOLTAGE
- ★ LOADS AND SAVES EPROM BUFFER TO DISK
- ★ READ, WRITE, COPY, VERIFY OR CHECK BLANK
- ★ DEBUG STYLE EDITOR FOR EASY MODIFICATION OF PROGRAM
- ★ SPLITS OR COMBINES EPROMS OF DIFFERING SIZES
- ★ INTERNAL CARD WITH EXTERNAL CABLE FOR A ZIF SOCKET



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# 20MB HARD DISK SYSTEM ONLY $389.95!

## STATIC RAMS

| | | | |
|---|---|---|---|
| 2101 | 256x4 | (450ns) | 1.95 |
| 5101 | 256x4 | (450ns)(CMOS) | 3.95 |
| 2102L-4 | 1024x1 | (450ns)(LP) | .99 |
| 2112 | 256x4 | (450ns) | 2.99 |
| 2114 | 1024x4 | (450ns) | .99 |
| 2114L-4 | 1024x4 | (450ns)(LP) | 1.09 |
| 2114L-2 | 1024x4 | (200ns)(LP) | 1.49 |
| 2114L-15 | 1024x4 | (150ns)(LP) | 1.95 |
| TMS4044-4 | 4096x1 | (450ns) | 1.95 |
| TMM2016-150 | 2048x8 | (150ns) | 1.49 |
| TMM2016-100 | 2048x8 | (100ns) | 1.95 |
| HM6116-4 | 2048x8 | (200ns)(CMOS) | 1.89 |
| HM6116-3 | 2048x8 | (150ns)(CMOS) | 1.95 |
| HM6116LP-4 | 2048x8 | (200ns)(CMOS)(LP) | 1.95 |
| HM6116LP-3 | 2048x8 | (150ns)(CMOS)(LP) | 2.05 |
| HM6116LP-2 | 2048x8 | (120ns)(CMOS)(LP) | 2.95 |
| HM6264P-15 | 8192x8 | (150ns)(CMOS) | 3.89 |
| HM6264LP-15 | 8192x8 | (150ns)(CMOS)(LP) | 3.95 |
| HM6264LP-12 | 8192x8 | (120ns)(CMOS)(LP) | 4.49 |

LP=Low power

## DYNAMIC RAMS

| | | | |
|---|---|---|---|
| 4116-250 | 16384x1 | (250ns) | .49 |
| 4116-200 | 16384x1 | (200ns) | .89 |
| 4116-150 | 16384x1 | (150ns) | .99 |
| 4116-120 | 16384x1 | (120ns) | 1.49 |
| MK4332 | 32768x1 | (200ns) | 6.95 |
| 4164-200 | 65536x1 | (200ns)(5v) | 1.19 |
| 4164-150 | 65536x1 | (150ns)(5v) | 1.29 |
| 4164-120 | 65536x1 | (120ns)(5v) | 1.95 |
| MCM6665 | 65536x1 | (200ns)(5v) | 1.95 |
| TMS4164 | 65536x1 | (150ns)(5v) | 1.95 |
| 4164-REFRESH | 65536x1 | (150ns)(5V)(REFRESH) | 2.95 |
| TMS4416 | 16384x4 | (150ns)(5v) | 4.95 |
| 41128-150 | 131072x1 | (150ns)(5v) | 5.95 |
| TMS4464-15 | 65536x4 | (150ns)(5v) | 6.95 |
| 41256-200 | 262144x1 | (200ns)(5v) | 2.95 |
| 41256-150 | 262144x1 | (150ns)(5v) | 2.95 |

5v=Single 5 Volt Supply REFRESH=Pin 1 Refresh

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|---|---|---|---|
| 8MHz | V20 | UPD70108-8 | $13.95 |
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## EPROMS

| | | | |
|---|---|---|---|
| 2708 | 1024x8 | (450ns) | 4.95 |
| 2716 | 2048x8 | (450ns)(5V) | 3.49 |
| 2716-1 | 2048x8 | (350ns)(5V) | 3.95 |
| TMS2532 | 4096x8 | (450ns)(5V) | 5.95 |
| 2732 | 4096x8 | (450ns)(5V) | 3.95 |
| 2732A | 4096x8 | (250ns)(5V)(21V PGM) | 3.95 |
| 2732A-2 | 4096x8 | (200ns)(5V)(21V PGM) | 4.25 |
| 27C64 | 8192x8 | (250ns)(5V)(CMOS) | 5.95 |
| 2764 | 8192x8 | (450ns)(5V) | 3.49 |
| 2764-250 | 8192x8 | (250ns)(5V) | 3.95 |
| 2764-200 | 8192x8 | (200ns)(5V) | 4.25 |
| MCM68766 | 8192x8 | (350ns)(5V)(24 PIN) | 17.95 |
| 27128 | 16384x8 | (250ns)(5V) | 4.25 |
| 27C256 | 32768x8 | (250ns)(5V)(CMOS) | 10.95 |
| 27256 | 32768x8 | (250ns)(5V) | 7.49 |

5V=Single 5 Volt Supply 21V PGM=Program at 21 Volts

## SPECTRONICS CORPORATION EPROM ERASERS

| Model | Timer | Capacity Chip | Intensity (uW/Cm²) | Unit Price |
|---|---|---|---|---|
| PE-14 | NO | 9 | 8,000 | $83.00 |
| PE-14T | YES | 9 | 8,000 | $119.00 |
| PE-24T | YES | 12 | 9,600 | $175.00 |

## 8000

| | |
|---|---|
| 8035 | 1.49 |
| 8039 | 1.95 |
| 8080 | 2.95 |
| 8085 | 2.49 |
| 8087-2 | 169.95 |
| 8087 | 129.00 |
| 8088 | 6.95 |
| 8088-2 | 9.95 |
| 8155 | 2.49 |
| 8155-2 | 3.95 |
| 8748 | 7.95 |
| 8755 | 14.95 |
| 80286 | 129.95 |
| 80287 | 199.95 |

## 8200

| | |
|---|---|
| 8203 | 24.95 |
| 8205 | 3.29 |
| 8212 | 1.49 |
| 8216 | 1.49 |
| 8224 | 2.25 |
| 8237 | 4.95 |
| 8237-5 | 5.49 |
| 8250 | 6.55 |
| 8251 | 1.69 |
| 8251A | 1.89 |
| 8253 | 1.89 |
| 8253-5 | 1.95 |
| 8255 | 1.69 |
| 8255-5 | 1.89 |
| 8259 | 1.95 |
| 8259-5 | 2.29 |
| 8272 | 4.95 |
| 8279 | 2.49 |
| 8279-5 | 2.95 |
| 8282 | 3.95 |
| 8284 | 2.95 |
| 8286 | 3.95 |
| 8288 | 4.95 |

## Z-80

Z80-CPU 2.5 MHz 1.69

### 4.0 MHz

| | |
|---|---|
| Z80A-CPU | 1.79 |
| Z80A-CTC | 1.89 |
| Z80A-DART | 5.95 |
| Z80A-DMA | 5.95 |
| Z80A-PIO | 1.89 |
| Z80A-SIO/0 | 5.95 |
| Z80A-SIO/1 | 5.95 |
| Z80A-SIO/2 | 5.95 |

### 6.0 MHz

| | |
|---|---|
| Z80B-CPU | 3.75 |
| Z80B-CTC | 4.25 |
| Z80B-PIO | 4.25 |
| Z80B-DART | 14.95 |
| Z80B-SIO/0 | 12.95 |
| Z80B-SIO/2 | 12.95 |
| Z8671 ZILOG | 19.95 |

## 6500

### 1.0 MHz

| | |
|---|---|
| 6502 | 2.69 |
| 65C02 (CMOS) | 12.95 |
| 6507 | 9.95 |
| 6520 | 1.95 |
| 6522 | 4.95 |
| 6526 | 26.95 |
| 6532 | 6.95 |
| 6545 | 6.95 |
| 6551 | 5.95 |
| 6561 | 19.95 |
| 6581 | 34.95 |

### 2.0 MHz

| | |
|---|---|
| 6502A | 2.95 |
| 6520A | 2.95 |
| 6522A | 5.95 |
| 6532A | 11.95 |
| 6545A | 7.95 |
| 6551A | 6.95 |

### 3.0 MHz

| | |
|---|---|
| 6502B | 6.95 |

## 6800

### 1.0 MHz

| | |
|---|---|
| 6800 | 1.95 |
| 6802 | 4.95 |
| 6803 | 9.95 |
| 6809 | 5.95 |
| 6809E | 5.95 |
| 6810 | 1.95 |
| 6820 | 2.95 |
| 6821 | 1.95 |
| 6840 | 6.95 |
| 6843 | 19.95 |
| 6844 | 12.95 |
| 6845 | 4.95 |
| 6847 | 11.95 |
| 6850 | 1.95 |
| 6883 | 22.95 |

### 2.0 MHz

| | |
|---|---|
| 68B00 | 4.95 |
| 68B02 | 5.95 |
| 68B09E | 6.95 |
| 68B09 | 6.95 |
| 68B21 | 3.95 |
| 68B45 | 6.95 |
| 68B50 | 2.95 |
| 68B54 | 7.95 |

## CLOCK CIRCUITS

| | |
|---|---|
| MM5369 | 1.95 |
| MM5369-EST | 1.95 |
| MM58167 | 12.95 |
| MM58174 | 11.95 |
| MSM5832 | 2.95 |

## CRT CONTROLLERS

| | |
|---|---|
| 6845 | 4.95 |
| 68B45 | 8.95 |
| 6847 | 11.95 |
| HD46505SP | 6.95 |
| MC1372 | 2.95 |
| 8275 | 26.95 |
| 7220 | 19.95 |
| CRT5027 | 12.95 |
| CRT5037 | 9.95 |
| TMS9918A | 19.95 |

## DISK CONTROLLERS

| | |
|---|---|
| 1771 | 4.95 |
| 1791 | 9.95 |
| 1793 | 9.95 |
| 1795 | 12.95 |
| 1797 | 12.95 |
| 2791 | 19.95 |
| 2793 | 19.95 |
| 2797 | 29.95 |
| 6843 | 19.95 |
| 8272 | 4.95 |
| UPD765 | 4.95 |
| MB8876 | 12.95 |
| MB8877 | 12.95 |
| 1691 | 6.95 |
| 2143 | 6.95 |

## BIT RATE GENERATORS

| | |
|---|---|
| MC14411 | 9.95 |
| BR1941 | 4.95 |
| 4702 | 9.95 |
| COM8116 | 8.95 |
| MM5307 | 4.95 |

## UARTS

| | |
|---|---|
| AY5-1013 | 3.95 |
| AY3-1015 | 4.95 |
| TR1602 | 3.95 |
| 2651 | 4.95 |
| IM6402 | 6.95 |
| IM6403 | 9.95 |
| INS8250 | 6.95 |

## SOUND CHIPS

| | |
|---|---|
| 76477 | 5.95 |
| 76489 | 8.95 |
| SSI-263 | 39.95 |
| AY3-8910 | 12.95 |
| AY3-8912 | 12.95 |
| SP1000 | 39.00 |

## CRYSTALS

| | |
|---|---|
| 32.768 KHz | .95 |
| 1.0 MHz | 2.95 |
| 1.8432 | 2.95 |
| 2.0 | 1.95 |
| 2.097152 | 1.95 |
| 2.4576 | 1.95 |
| 3.2768 | 1.95 |
| 3.579545 | 1.95 |
| 4.0 | 1.95 |
| 4.032 | 1.95 |
| 5.0 | 1.95 |
| 5.0688 | 1.95 |
| 6.0 | 1.95 |
| 6.144 | 1.95 |
| 6.5536 | 1.95 |
| 8.0 | 1.95 |
| 10.0 | 1.95 |
| 10.738635 | 1.95 |
| 12.0 | 1.95 |
| 14.31818 | 1.95 |
| 15.0 | 1.95 |
| 16.0 | 1.95 |
| 17.430 | 1.95 |
| 18.0 | 1.95 |
| 18.432 | 1.95 |
| 20.0 | 1.95 |
| 22.1184 | 1.95 |
| 24.0 | 1.95 |
| 32.0 | 1.95 |

## CRYSTAL OSCILLATORS

| | |
|---|---|
| 1.0MHz | 5.95 |
| 1.8432 | 5.95 |
| 2.0 | 5.95 |
| 2.4576 | 5.95 |
| 2.5 | 4.95 |
| 4.0 | 4.95 |
| 5.0688 | 4.95 |
| 6.0 | 4.95 |
| 6.144 | 4.95 |
| 8.0 | 4.95 |
| 10.0 | 4.95 |
| 12.0 | 4.95 |
| 12.480 | 4.95 |
| 15.0 | 4.95 |
| 16.0 | 4.95 |
| 18.432 | 4.95 |
| 20.0 | 4.95 |
| 24.0 | 4.95 |

## MISC.

| | |
|---|---|
| TMS99531 | 9.95 |
| TMS99532 | 19.95 |
| ULN2003 | .79 |
| 3242 | 7.95 |
| 3341 | 4.95 |
| MC3470 | 1.95 |
| MC3480 | 8.95 |
| MC3487 | 2.95 |
| 11C90 | 19.95 |
| 2513-001 UP | 6.95 |
| AY5-2376 | 11.95 |
| AY5-3600 PRO | 11.95 |

## 74LS00

| | | | |
|---|---|---|---|
| 74LS00 | .16 | 74LS165 | .65 |
| 74LS01 | .18 | 74LS166 | .95 |
| 74LS02 | .17 | 74LS169 | .95 |
| 74LS03 | .18 | 74LS173 | .49 |
| 74LS04 | .16 | 74LS174 | .39 |
| 74LS05 | .18 | 74LS175 | .39 |
| 74LS08 | .18 | 74LS191 | .49 |
| 74LS09 | .18 | 74LS192 | .69 |
| 74LS10 | .16 | 74LS193 | .69 |
| 74LS11 | .22 | 74LS194 | .69 |
| 74LS12 | .22 | 74LS195 | .69 |
| 74LS13 | .26 | 74LS196 | .59 |
| 74LS14 | .39 | 74LS197 | .59 |
| 74LS15 | .26 | 74LS221 | .59 |
| 74LS20 | .17 | 74LS240 | .69 |
| 74LS21 | .22 | 74LS241 | .69 |
| 74LS22 | .22 | 74LS242 | .69 |
| 74LS27 | .23 | 74LS243 | .69 |
| 74LS28 | .26 | 74LS244 | .69 |
| 74LS30 | .17 | 74LS245 | .79 |
| 74LS32 | .18 | 74LS251 | .49 |
| 74LS33 | .28 | 74LS253 | .49 |
| 74LS37 | .26 | 74LS256 | 1.79 |
| 74LS38 | .26 | 74LS257 | .39 |
| 74LS42 | .39 | 74LS258 | .49 |
| 74LS47 | .75 | 74LS259 | 1.29 |
| 74LS48 | .85 | 74LS260 | .49 |
| 74LS51 | .17 | 74LS266 | .39 |
| 74LS73 | .29 | 74LS273 | .79 |
| 74LS74 | .24 | 74LS279 | .39 |
| 74LS75 | .29 | 74LS280 | 1.98 |
| 74LS76 | .29 | 74LS283 | .59 |
| 74LS83 | .49 | 74LS290 | .89 |
| 74LS85 | .49 | 74LS293 | .89 |
| 74LS86 | .22 | 74LS299 | 1.49 |
| 74LS90 | .39 | 74LS322 | 3.95 |
| 74LS92 | .49 | 74LS323 | 2.49 |
| 74LS93 | .39 | 74LS364 | 1.95 |
| 74LS95 | .49 | 74LS365 | .39 |
| 74LS107 | .34 | 74LS367 | .39 |
| 74LS109 | .36 | 74LS368 | .39 |
| 74LS112 | .29 | 74LS373 | .79 |
| 74LS122 | .45 | 74LS374 | .79 |
| 74LS123 | .49 | 74LS375 | .95 |
| 74LS124 | 2.75 | 74LS377 | .79 |
| 74LS125 | .39 | 74LS378 | 1.18 |
| 74LS126 | .39 | 74LS390 | 1.19 |
| 74LS132 | .39 | 74LS393 | .79 |
| 74LS133 | .49 | 74LS541 | 1.49 |
| 74LS136 | .39 | 74LS624 | 1.95 |
| 74LS138 | .39 | 74LS640 | .99 |
| 74LS139 | .39 | 74LS645 | .99 |
| 74LS145 | .99 | 74LS669 | 1.29 |
| 74LS147 | .99 | 74LS670 | .89 |
| 74LS148 | .99 | 74LS682 | 3.20 |
| 74LS151 | .39 | 74LS683 | 3.20 |
| 74LS153 | .39 | 74LS684 | 3.20 |
| 74LS154 | 1.49 | 74LS688 | 2.40 |
| 74LS155 | .59 | 74LS783 | 22.95 |
| 74LS156 | .49 | 81LS95 | 1.49 |
| 74LS157 | .35 | 81LS96 | 1.49 |
| 74LS158 | .29 | 81LS97 | 1.49 |
| 74LS160 | .29 | 81LS98 | 1.49 |
| 74LS161 | .39 | 25LS2521 | 2.80 |
| 74LS162 | .49 | 25LS2569 | 2.80 |
| 74LS163 | .39 | 26LS31 | 1.95 |
| 74LS164 | .49 | 26LS32 | 1.95 |

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### 74HC00

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| | | | |
|---|---|---|---|
| 74HC00 | .59 | 74HC148 | 1.19 |
| 74HC02 | .59 | 74HC151 | .89 |
| 74HC04 | .59 | 74HC154 | 2.49 |
| 74HC08 | .59 | 74HC157 | .89 |
| 74HC10 | .59 | 74HC158 | .95 |
| 74HC14 | .79 | 74HC163 | 1.15 |
| 74HC20 | .59 | 74HC175 | .99 |
| 74HC27 | .59 | 74HC240 | 1.89 |
| 74HC30 | .59 | 74HC244 | 1.89 |
| 74HC32 | .69 | 74HC245 | 1.89 |
| 74HC51 | .59 | 74HC257 | .85 |
| 74HC74 | .75 | 74HC259 | 1.39 |
| 74HC85 | 1.35 | 74HC273 | 1.89 |
| 74HC86 | .69 | 74HC299 | 4.99 |
| 74HC93 | 1.19 | 74HC368 | .99 |
| 74HC107 | .79 | 74HC373 | 2.29 |
| 74HC109 | .79 | 74HC374 | 2.29 |
| 74HC112 | .79 | 74HC390 | 1.39 |
| 74HC125 | 1.19 | 74HC393 | 1.39 |
| 74HC132 | 1.19 | 74HC4017 | 1.99 |
| 74HC133 | .69 | 74HC4020 | 1.39 |
| 74HC138 | .99 | 74HC4049 | .89 |
| 74HC139 | .99 | 74HC4050 | .89 |

### 74HCT00

74HCT: Direct, drop-in replacements for LS TTL and can be intermixed with 74LS in the same circuit.

| | | | |
|---|---|---|---|
| 74HCT00 | .69 | 74HCT166 | 3.05 |
| 74HCT02 | .69 | 74HCT174 | 1.09 |
| 74HCT04 | .69 | 74HCT193 | 1.39 |
| 74HCT08 | .69 | 74HCT194 | 1.19 |
| 74HCT10 | .69 | 74HCT240 | 2.19 |
| 74HCT11 | .69 | 74HCT241 | 2.19 |
| 74HCT27 | .69 | 74HCT244 | 2.19 |
| 74HCT30 | .69 | 74HCT245 | 2.19 |
| 74HCT32 | .79 | 74HCT257 | .99 |
| 74HCT74 | .85 | 74HCT259 | 1.59 |
| 74HCT75 | .95 | 74HCT273 | 2.09 |
| 74HCT138 | 1.15 | 74HCT367 | 1.09 |
| 74HCT139 | 1.15 | 74HCT373 | 2.49 |
| 74HCT154 | 2.99 | 74HCT374 | 2.49 |
| 74HCT157 | .99 | 74HCT393 | 1.59 |
| 74HCT158 | .99 | 74HCT4017 | 2.19 |
| 74HCT161 | 1.29 | 74HCT4040 | 1.59 |
| 74HCT164 | 1.39 | 74HCT4060 | 1.49 |

## 74F00

| | | | | | |
|---|---|---|---|---|---|
| 74F00 | .69 | 74F74 | .79 | 74F251 | 1.69 |
| 74F02 | .69 | 74F86 | .99 | 74F253 | 1.69 |
| 74F04 | .79 | 74F138 | 1.69 | 74F257 | 1.69 |
| 74F08 | .69 | 74F139 | 1.69 | 74F280 | 1.79 |
| 74F10 | .69 | 74F157 | 1.69 | 74F283 | 3.95 |
| 74F32 | .69 | 74F240 | 3.29 | 74F373 | 4.29 |
| 74F64 | .89 | 74F244 | 3.29 | 74F374 | 4.29 |

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## CMOS

| | | | |
|---|---|---|---|
| 4001 | .19 | 14419 | 4.95 |
| 4011 | .19 | 14433 | 14.95 |
| 4012 | .25 | 4503 | .49 |
| 4013 | .35 | 4511 | .69 |
| 4015 | .29 | 4516 | .79 |
| 4016 | .29 | 4518 | .85 |
| 4017 | .49 | 4522 | .79 |
| 4018 | .69 | 4526 | .79 |
| 4020 | .59 | 4527 | 1.95 |
| 4021 | .69 | 4528 | .79 |
| 4024 | .49 | 4529 | 2.95 |
| 4025 | .25 | 4532 | 1.95 |
| 4027 | .39 | 4538 | .95 |
| 4028 | .65 | 4541 | 1.29 |
| 4035 | .69 | 4553 | 5.79 |
| 4040 | .69 | 4585 | .75 |
| 4041 | .75 | 4702 | 12.95 |
| 4042 | .59 | 74C00 | .29 |
| 4043 | .85 | 74C14 | .59 |
| 4044 | .69 | 74C74 | .59 |
| 4045 | 1.98 | 74C83 | 1.95 |
| 4046 | .69 | 74C85 | 1.49 |
| 4047 | .69 | 74C95 | .99 |
| 4049 | .29 | 74C150 | 5.75 |
| 4050 | .29 | 74C151 | 2.25 |
| 4051 | .69 | 74C161 | .99 |
| 4052 | .69 | 74C163 | .99 |
| 4053 | .69 | 74C164 | 1.39 |
| 4056 | 2.19 | 74C192 | 1.49 |
| 4060 | .69 | 74C193 | 1.49 |
| 4066 | .29 | 74C221 | 2.49 |
| 4069 | .19 | 74C240 | 1.89 |
| 4076 | .59 | 74C244 | 1.89 |
| 4077 | .29 | 74C374 | 1.99 |
| 4081 | .22 | 74C905 | 10.95 |
| 4085 | .79 | 74C911 | 8.95 |
| 4086 | .89 | 74C917 | 12.95 |
| 4093 | .49 | 74C922 | 4.49 |
| 4094 | 2.49 | 74C923 | 4.95 |
| 14411 | 9.95 | 74C926 | 7.95 |
| 14412 | 6.95 | 80C97 | .95 |

## 7400/9000

| | | | |
|---|---|---|---|
| 7400 | .19 | 74147 | 2.49 |
| 7402 | .19 | 74148 | 1.20 |
| 7404 | .19 | 74150 | 1.35 |
| 7406 | .29 | 74151 | .55 |
| 7407 | .29 | 74153 | .55 |
| 7408 | .24 | 74154 | 1.49 |
| 7410 | .19 | 74155 | .75 |
| 7411 | .25 | 74157 | .55 |
| 7414 | .49 | 74159 | 1.65 |
| 7416 | .25 | 74161 | .69 |
| 7417 | .25 | 74163 | .69 |
| 7420 | .19 | 74164 | .85 |
| 7423 | .29 | 74165 | .85 |
| 7430 | .19 | 74166 | 1.00 |
| 7432 | .29 | 74175 | .89 |
| 7438 | .29 | 74177 | .75 |
| 7442 | .49 | 74178 | 1.15 |
| 7445 | .69 | 74181 | 2.25 |
| 7447 | .89 | 74182 | .75 |
| 7470 | .35 | 74184 | 2.00 |
| 7473 | .34 | 74191 | 1.15 |
| 7474 | .33 | 74192 | .79 |
| 7475 | .45 | 74194 | .85 |
| 7476 | .35 | 74196 | .79 |
| 7483 | .50 | 74197 | .75 |
| 7485 | .59 | 74199 | 1.35 |
| 7486 | .35 | 74221 | 1.35 |
| 7489 | 2.15 | 74246 | 1.35 |
| 7490 | .39 | 74247 | 1.25 |
| 7492 | .50 | 74248 | 1.85 |
| 7493 | .35 | 74249 | 1.95 |
| 7495 | .55 | 74251 | .75 |
| 7497 | 2.75 | 74265 | 1.35 |
| 74100 | 2.29 | 74273 | 1.95 |
| 74121 | .29 | 74278 | 3.11 |
| 74123 | .49 | 74367 | .65 |
| 74125 | .45 | 74368 | .65 |
| 74141 | .65 | 9368 | 3.95 |
| 74143 | 5.95 | 9602 | 1.50 |
| 74144 | 2.95 | 9637 | 2.95 |
| 74145 | .60 | 96S02 | 1.95 |

## 74S00

| | | | |
|---|---|---|---|
| 74S00 | .29 | 74S163 | 1.29 |
| 74S02 | .29 | 74S168 | 3.95 |
| 74S03 | .29 | 74S174 | .79 |
| 74S04 | .29 | 74S175 | .79 |
| 74S05 | .29 | 74S188 | 1.95 |
| 74S08 | .35 | 74S189 | 1.95 |
| 74S10 | .29 | 74S195 | 1.49 |
| 74S15 | .49 | 74S196 | 2.49 |
| 74S30 | .29 | 74S197 | 2.95 |
| 74S32 | .35 | 74S226 | 3.99 |
| 74S37 | .69 | 74S240 | 1.49 |
| 74S38 | .69 | 74S241 | 1.49 |
| 74S74 | .49 | 74S244 | 1.49 |
| 74S85 | .95 | 74S257 | .79 |
| 74S86 | .35 | 74S253 | .79 |
| 74S112 | .50 | 74S258 | .95 |
| 74S124 | 2.75 | 74S280 | 1.95 |
| 74S138 | .79 | 74S287 | 1.69 |
| 74S140 | .55 | 74S288 | 1.69 |
| 74S151 | .79 | 74S299 | 2.95 |
| 74S153 | .79 | 74S373 | 1.69 |
| 74S157 | .79 | 74S374 | 1.69 |
| 74S158 | .95 | 74S471 | 4.95 |
| 74S161 | 1.29 | 74S571 | 2.95 |

## VOLTAGE REGULATORS

### TO-220 CASE

| | | | |
|---|---|---|---|
| 7805T | .49 | 7905T | .59 |
| 7808T | .49 | 7908T | .59 |
| 7812T | .49 | 7912T | .59 |
| 7815T | .49 | 7915T | .59 |

### TO-3 CASE

| | | | |
|---|---|---|---|
| 7805K | 1.59 | 7905K | 1.69 |
| 7812K | 1.39 | 7912K | 1.49 |

### TO-93 CASE

| | | | |
|---|---|---|---|
| 78L05 | .49 | 79L05 | .69 |
| 78L12 | .49 | 79L12 | 1.49 |

### OTHER VOLTAGE REGS

| | | | |
|---|---|---|---|
| LM323K | 5V 3A | TO-3 | 4.79 |
| LM328K | Adj. 5A | TO-3 | 3.95 |
| 78H05K | 5V 5A | TO-3 | 7.95 |
| 78H12K | 12V 5A | TO-3 | 8.95 |
| 78P05K | 5V 10A | TO-3 | 14.95 |

## LINEAR

| | | | |
|---|---|---|---|
| TL066 | .99 | LM733 | .98 |
| TL071 | .69 | LM741 | .29 |
| TL072 | 1.09 | LM747 | .69 |
| TL074 | 1.95 | LM748 | .59 |
| TL081 | .59 | MC1330 | 1.69 |
| TL082 | .99 | MC1350 | 1.19 |
| TL084 | 1.49 | MC1372 | 6.95 |
| LM301 | .34 | LM1414 | 1.59 |
| LM309K | 1.25 | LM1458 | .49 |
| LM311 | .59 | LM1488 | .49 |
| LM311H | .89 | LM1489 | .49 |
| LM317K | 3.49 | LM1496 | .85 |
| LM317T | .95 | LM1812 | 8.25 |
| LM318 | 1.49 | LM1889 | 1.95 |
| LM319 | 1.25 | ULN2003 | .79 |
| LM320 | see7900 | XR2206 | 3.95 |
| LM322 | 1.95 | XR2211 | 2.95 |
| LM323K | 4.79 | XR2240 | 1.95 |
| LM324 | .49 | MPQ2907 | 1.95 |
| LM331 | 3.95 | LM2917 | 1.95 |
| LM334 | 1.19 | CA3046 | .89 |
| LM335 | 1.79 | CA3081 | .99 |
| LM336 | 1.75 | CA3082 | .99 |
| LM337K | 3.95 | CA3086 | .80 |
| LM338K | 6.95 | CA3089 | 1.95 |
| LM339 | .59 | CA3130E | .99 |
| LM340 | see7800 | CA3146 | 1.29 |
| LM350T | 4.60 | CA3160 | 1.19 |
| LF353 | .59 | MC3470 | 1.95 |
| LF356 | .99 | MC3480 | 8.95 |
| LF357 | .99 | MC3487 | 2.95 |
| LM358 | .59 | LM3900 | .49 |
| LM380 | .89 | LM3909 | .98 |
| LM383 | 1.95 | LM3911 | 2.25 |
| LM386 | .89 | LM3914 | 2.39 |
| LM393 | .45 | MC4024 | 3.49 |
| LM394H | 5.95 | MC4044 | 3.99 |
| TL494 | 4.20 | RC4136 | 1.25 |
| TL497 | 3.25 | RC4558 | .69 |
| NE555 | .29 | LM13600 | 1.49 |
| NE556 | .49 | 75107 | 1.49 |
| NE558 | 1.29 | 75110 | 1.95 |
| NE564 | 1.95 | 75150 | 1.95 |
| LM565 | .95 | 75154 | 1.95 |
| LM566 | 1.49 | 75188 | 1.25 |
| LM567 | .79 | 75189 | 1.25 |
| NE570 | 2.95 | 75451 | .39 |
| NE590 | 2.50 | 75452 | .39 |
| NE592 | .98 | 75453 | .39 |
| LM710 | .75 | 75477 | 1.29 |
| LM723 | .49 | 75492 | .79 |

H=TO-5 CAN, K=TO-3, T=TO-220

## DATA ACQ

| | | | |
|---|---|---|---|
| ADC0800 | 15.55 | 8T26 | 1.29 |
| ADC0804 | 3.49 | 8T28 | 1.29 |
| ADC0809 | 4.49 | 8T95 | .89 |
| ADC0816 | 14.95 | 8T96 | .89 |
| ADC0817 | 9.95 | 8T97 | .59 |
| ADC0831 | 8.95 | 8T98 | .89 |
| DAC0800 | 4.49 | DM8131 | 2.95 |
| DAC0806 | 1.95 | DP8304 | 2.29 |
| DAC0808 | 2.95 | DS8833 | 2.25 |
| DAC1020 | 8.25 | DS8835 | 1.99 |
| DAC1022 | 5.95 | DS8836 | .99 |
| MC1408L8 | 2.95 | DS8837 | 1.65 |

## INTERFACE

## IC SOCKETS

| | 1-99 | 100+ |
|---|---|---|
| 8 PIN ST | .11 | .10 |
| 14 PIN ST | .11 | .09 |
| 16 PIN ST | .12 | .10 |
| 18 PIN ST | .15 | .13 |
| 20 PIN ST | .18 | .15 |
| 22 PIN ST | .15 | .12 |
| 24 PIN ST | .20 | .15 |
| 28 PIN ST | .22 | .16 |
| 40 PIN ST | .30 | .22 |
| 64 PIN ST | 1.95 | 1.49 |
| ST=SOLDERTAIL | | |
| 8 PIN WW | .59 | .69 |
| 14 PIN WW | .69 | .52 |
| 16 PIN WW | .69 | .58 |
| 18 PIN WW | .99 | .90 |
| 20 PIN WW | 1.09 | .98 |
| 22 PIN WW | 1.39 | 1.28 |
| 24 PIN WW | 1.49 | 1.35 |
| 28 PIN WW | 1.69 | 1.49 |
| 40 PIN WW | 1.99 | 1.80 |
| WW=WIREWRAP | | |
| 16 PIN ZIF | 4.95 | CALL |
| 24 PIN ZIF | 5.95 | CALL |
| 28 PIN ZIF | 6.95 | CALL |
| 40 PIN ZIF | 9.95 | CALL |
| ZIF=TEXTOOL (ZERO INSERTION FORCE) | | |

## EDGECARD CONNECTORS

| | | | | |
|---|---|---|---|---|
| 100 PIN | ST | S-100 | .125 | 3.95 |
| 100 PIN | WW | S-100 | .125 | 4.95 |
| 62 PIN | ST | IBM PC | .100 | 1.95 |
| 50 PIN | ST | APPLE | .100 | 2.95 |
| 44 PIN | ST | STD | .156 | 1.95 |
| 44 PIN | WW | STD | .156 | 4.95 |

## 36 PIN CENTRONICS

| | | |
|---|---|---|
| **MALE** | | |
| IDCEN36 | RIBBON CABLE | 6.95 |
| CEN36 | SOLDER CUP | 4.95 |
| **FEMALE** | | |
| IDCEN36/F | RIBBON CABLE | 7.95 |
| CEN36PC | RT ANGLE PC MOUNT | 4.95 |

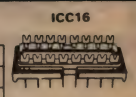
## INTERSIL

| | |
|---|---|
| ICL7106 | 9.95 |
| ICL7107 | 12.95 |
| ICL7660 | 2.95 |
| ICL8038 | 4.95 |
| ICM7207A | 5.95 |
| ICM7208 | 15.95 |

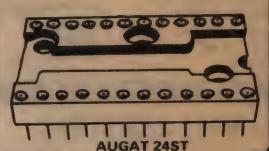
## DIP CONNECTORS

| DESCRIPTION | ORDER BY | CONTACTS 8 | 14 | 16 | 18 | 20 | 22 | 24 | 28 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|
| HIGH RELIABILITY TOOLED ST IC SOCKETS | AUGATxxST | .62 | .79 | .89 | 1.09 | 1.29 | 1.39 | 1.49 | 1.69 | 2.49 |
| HIGH RELIABILITY TOOLED WW IC SOCKETS | AUGATxxWW | 1.30 | 1.80 | 2.10 | 2.40 | 2.50 | 2.90 | 3.15 | 3.70 | 5.40 |
| COMPONENT CARRIES (DIP HEADERS) | ICCxx | .49 | .59 | .69 | .99 | .99 | .99 | .99 | 1.09 | 1.49 |
| RIBBON CABLE DIP PLUGS (IDC) | IDPxx | --- | .95 | .95 | --- | --- | --- | 1.75 | --- | 2.95 |

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE BELOW


ICC16

IDP14


AUGAT 24ST

## DIODES/OPTO/TRANSISTORS

| | | | |
|---|---|---|---|
| 1N751 | .25 | 4N26 | .69 |
| 1N759 | .25 | 4N27 | .69 |
| 1N4148 | 25/1.00 | 4N28 | .69 |
| 1N4004 | 10/1.00 | 4N33 | .89 |
| 1N5402 | .25 | 4N37 | 1.19 |
| KBP04 | .55 | MCT-2 | .59 |
| KBU8A | .95 | MCT-6 | 1.29 |
| MDA990-2 | .35 | TIL-111 | .99 |
| N2222 | .25 | 2N3906 | .10 |
| PN2222 | .10 | 2N4401 | .25 |
| 2N2905 | .50 | 2N4402 | .25 |
| 2N2907 | .25 | 2N4403 | .25 |
| 2N3055 | .79 | 2N6045 | 1.75 |
| 2N3904 | .10 | TIP31 | .49 |

## D-SUBMINIATURE

| DESCRIPTION | | ORDER BY | CONTACTS 9 | 15 | 19 | 25 | 37 | 50 |
|---|---|---|---|---|---|---|---|---|
| SOLDER CUP | MALE | DBxxP | .82 | .90 | 1.25 | 1.25 | 1.80 | 3.48 |
| | FEMALE | DBxxS | .95 | 1.15 | 1.50 | 1.50 | 2.35 | 4.32 |
| RIGHT ANGLE PC SOLDER | MALE | DBxxPR | 1.20 | 1.49 | --- | 1.95 | 2.65 | --- |
| | FEMALE | DBxxSR | 1.25 | 1.55 | --- | 2.00 | 2.79 | --- |
| WIRE WRAP | MALE | DBxxPWW | 1.69 | 2.56 | --- | 3.89 | 5.60 | --- |
| | FEMALE | DBxxSWW | 2.76 | 4.27 | --- | 6.84 | 9.95 | --- |
| IDC RIBBON CABLE | MALE | IDBxxP | 2.70 | 2.95 | --- | 3.98 | 5.70 | --- |
| | FEMALE | IDBxxS | 2.92 | 3.20 | --- | 4.33 | 6.76 | --- |
| HOODS | METAL | MHOODxx | 1.25 | 1.25 | 1.30 | 1.30 | --- | --- |
| | GREY | HOODxx | .65 | .65 | --- | .65 | .75 | .95 |

*ORDERING INSTRUCTIONS: INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED.*

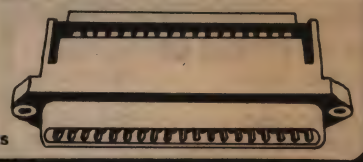
*EXAMPLE: A 15 PIN RIGHT ANGLE MALE PC SOLDER WOULD BE DB15PR.*

**MOUNTING HARDWARE $1.00**

MTG HDWR

HOOD25

DB37S


IDB37S

## LED DISPLAYS

| | | | | |
|---|---|---|---|---|
| FND-357(359) | | COM CATHODE | .362" | 1.25 |
| FND-500(503) | | COM CATHODE | .5" | 1.49 |
| FND-507(510) | | COM ANODE | .5" | 1.49 |
| MAN-72 | | COM ANODE | .3" | .99 |
| MAN-74 | | COM CATHODE | .3" | .99 |
| MAN-8940 | | COM CATHODE | .8" | 1.99 |
| TIL-313 | | COM CATHODE | .3" | .45 |
| HP5082-7760 | | COM CATHODE | .43" | 1.29 |
| TIL-311 | 4x7 | HEX W/LOGIC | .270" | 9.95 |
| HP5082-7340 | 4x7 | HEX W/LOGIC | .290" | 7.95 |

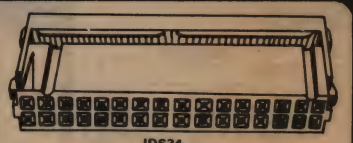
## DIFFUSED LEDS

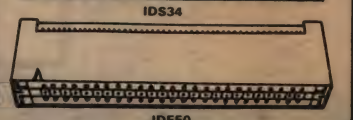
| | | 1-99 | 100-UP |
|---|---|---|---|
| JUMBO RED | T1¾ | .10 | .09 |
| JUMBO GREEN | T1¾ | .14 | .12 |
| JUMBO YELLOW | T1¾ | .14 | .12 |
| MOUNTING HDW | T1¾ | .10 | .09 |
| MINI RED | T1 | .10 | .09 |

## IDC CONNECTORS

| DESCRIPTION | ORDER BY | CONTACTS 10 | 20 | 26 | 34 | 40 | 50 |
|---|---|---|---|---|---|---|---|
| SOLDER HEADER | IDHxxS | .82 | 1.29 | 1.68 | 2.20 | 2.58 | 3.24 |
| RIGHT ANGLE SOLDER HEADER | IDHxxSR | .85 | 1.35 | 1.76 | 2.31 | 2.72 | 3.39 |
| WW HEADER | IDHxxW | 1.86 | 2.98 | 3.84 | 4.50 | 5.28 | 6.63 |
| RIGHT ANGLE WW HEADER | IDHxxWR | 2.05 | 3.28 | 4.22 | 4.45 | 4.80 | 7.30 |
| RIBBON HEADER SOCKET | IDSxx | .79 | .99 | 1.39 | 1.59 | 1.99 | 2.25 |
| RIBBON HEADER | IDMxx | --- | 5.50 | 6.25 | 7.00 | 7.50 | 8.50 |
| RIBBON EDGE CARD | IDExx | 1.75 | 2.25 | 2.65 | 2.75 | 3.80 | 3.95 |

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE ABOVE


IDS34


IDE50

## SWITCHES

| | | |
|---|---|---|
| SPDT | MINI-TOGGLE ON-ON | 1.25 |
| DPDT | MINI-TOGGLE ON-ON | 1.50 |
| DPDT | MINI-TOGGLE ON-OFF-ON | 1.75 |
| SPST | MINI-PUSHBUTTON N.O. | .39 |
| SPST | MINI-PUSHBUTTON N.C. | .39 |
| SPST | TOGGLE ON-OFF | .49 |
| BCD OUTPUT 10 POSITION 6 PIN DIP | | 1.95 |

## DIP SWITCHES

| | | | |
|---|---|---|---|
| 4 POSITION | .85 | 7 POSITION | .95 |
| 5 POSITION | .90 | 8 POSITION | .95 |
| 6 POSITION | .90 | 10 POSITION | 1.29 |

## HARD TO FIND "SNAPABLE" HEADERS

CAN BE SNAPPED APART TO MAKE ANY SIZE HEADER, ALL WITH .1" CENTERS

| | | |
|---|---|---|
| 1x40 | STRAIGHT LEAD | .99 |
| 1x40 | RIGHT ANGLE | 1.49 |
| 2x40 | STRAIGHT LEAD | 2.49 |
| 2x40 | RIGHT ANGLE | 2.99 |

## SHORTING BLOCKS

GOLD CONTACTS SPACED AT .1" CENTERS

**5/$1.00**

Dear Mr. Rose:

I feel compelled to commend you and your people for the pleasant, polite, willingness to help and professional attitude you have displayed. In these times it is indeed refreshing to deal with a company whose staff consists of people of this caliber. My friends and associates will most certainly be doing business with you again.

Sincerely, Nicholas Chabra

## RIBBON CABLE

| CONTACTS | SINGLE COLOR 1' | 10' | COLOR CODED 1' | 10' |
|---|---|---|---|---|
| 10 | .18 | 1.60 | .30 | 2.75 |
| 16 | .28 | 2.50 | .48 | 4.40 |
| 20 | .36 | 3.20 | .60 | 5.50 |
| 25 | .45 | 4.00 | .75 | 6.85 |
| 26 | .46 | 4.10 | .78 | 7.15 |
| 34 | .61 | 5.40 | 1.07 | 9.35 |
| 40 | .72 | 6.40 | 1.20 | 11.00 |
| 50 | .89 | 7.50 | 1.50 | 13.25 |

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**20 MEG FULL HEIGHT HARD DISK DRIVE**

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**$349.95**

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**PRECUT ASSORTMENT**
IN ASSORTED COLORS $27.50

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250ea: 2.5", 4.5", 5.0"
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**SPOOLS**

| | | | |
|---|---|---|---|
| 100 feet | $4.30 | 250 feet | $7.25 |
| 500 feet | $13.25 | 1000 feet | $21.95 |

*Please specify color: Blue, Black, Yellow or Red*

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- MANUFACTURED BY CORCOM
- LOW COST
- FITS LC-HP BELOW
- 6 AMP 120/240 VOLT

## 6 FOOT LINE CORDS

| | | |
|---|---|---|
| LC-2 | 2 CONDUCTOR | .39 |
| LC-3 | 3 CONDUCTOR | .99 |
| LC-HP | 3 CONDUCTOR W/STD FEMALE SOCKET | 1.49 |

## MUFFIN FANS

| | | |
|---|---|---|
| 3.15" SQ | ROTRON | 14.95 |
| 3.63" SQ | ETRI | 14.95 |
| 3.18" SQ | MASUSHITA | 16.95 |

## WIRE WRAP PROTOTYPE CARDS

FR-4 EPOXY GLASS LAMINATE
WITH GOLD-PLATED EDGE-CARD FINGERS

IBM-PR2

### IBM

*BOTH CARDS HAVE SILK SCREENED LEGENDS AND INCLUDES MOUNTING BRACKET*

| | | |
|---|---|---|
| IBM-PR1 | WITH +5V AND GROUND PLANE | $27.95 |
| IBM-PR2 | AS ABOVE WITH DECODING LAYOUT | $29.95 |

### S-100

| | | |
|---|---|---|
| P100-1 | BARE - NO FOIL PADS | $15.15 |
| P100-2 | HORIZONTAL BUS | $21.80 |
| P100-3 | VERTICAL BUS | $21.80 |
| P100-4 | SINGLE FOIL PADS PER HOLE | $22.75 |

### APPLE

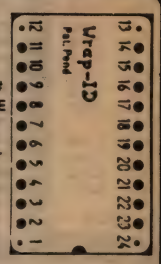
| | | |
|---|---|---|
| P500-1 | BARE - NO FOIL PADS | $15.15 |
| P500-3 | HORIZONTAL BUS | $22.75 |
| P500-4 | SINGLE FOIL PADS PER HOLE | $21.80 |
| 7060-45 | FOR APPLE IIe AUX SLOT | $30.00 |

## SOCKET-WRAP I.D.™

- SLIPS OVER WIRE WRAP PINS
- IDENTIFIES PIN NUMBERS ON WRAP SIDE OF BOARD
- CAN WRITE ON PLASTIC; SUCH AS IC #

| PINS | PART# | PCK. OF | PRICE |
|---|---|---|---|
| 8 | IDWRAP 08 | 10 | 1.95 |
| 14 | IDWRAP 14 | 10 | 1.95 |
| 16 | IDWRAP 16 | 10 | 1.95 |
| 18 | IDWRAP 18 | 5 | 1.95 |
| 20 | IDWRAP 20 | 5 | 1.95 |
| 22 | IDWRAP 22 | 5 | 1.95 |
| 24 | IDWRAP 24 | 5 | 1.95 |
| 28 | IDWRAP 28 | 5 | 1.95 |
| 40 | IDWRAP 40 | 5 | 1.95 |

PLEASE ORDER BY NUMBER OF PACKAGES (PCK. OF)




ID WRAP 24

## FRAME STYLE TRANSFORMERS

| | | |
|---|---|---|
| 12.6V AC CT | 2 AMP | 5.95 |
| 12.6V AC CT | 4 AMP | 7.95 |
| 12.6V AC CT | 8 AMP | 10.95 |
| 25.2V AC CT | 2 AMP | 7.95 |

## 25 PIN D-SUB GENDER CHANGERS

**$7.95**

## SWITCHING POWER SUPPLIES

### PS-IBM $89.95

- FOR IBM PC-XT COMPATIBLE
- 135 WATTS
- +5V @ 15A, +12V @ 4.2A -5V @ .5A, -12V @ .5A
- ONE YEAR WARRANTY

PS-IBM

### PS-IBM-150 $79.95

- FOR IBM PC-XT COMPATIBLE
- 150 WATTS
- +12V @ 5.2A, +5V @ 16A -12V @ .5A, -5V @ .5A
- ONE YEAR WARRANTY

PS-130

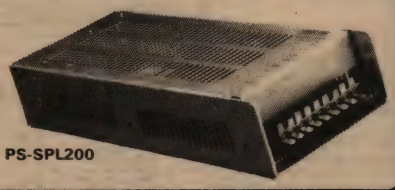
### PS-130 $99.95

- 130 WATTS
- SWITCH ON REAR
- FOR USE IN OTHER IBM TYPE MACHINES
- 90 DAY WARRANTY

PS-A

### PS-A $49.95

- USE TO POWER APPLE TYPE SYSTEMS, 79.5 WATTS
- +5V @ 7A, +12V @ 3A -5V @ .5A, -12V @ .5A
- APPLE POWER CONNECTOR



PS-SPL200

### PS-SPL200 $49.95

- +5V @ 25A, +12V @ 3.5A -5V @ 1A, -12V @ 1A
- UL APPROVED
- ALUMINUM ENCLOSURE

## CAPACITORS

### TANTALUM

| | | | | | |
|---|---|---|---|---|---|
| 1.0µf | 15V | .35 | .47µf | 35V | .45 |
| 6.8 | 15V | .70 | 1.0 | 35V | .45 |
| 10 | 15V | .80 | 2.2 | 35V | .65 |
| 22 | 15V | 1.35 | 4.7 | 35V | .85 |
| .22 | 35V | .40 | 10 | 35V | 1.00 |

### DISC

| | | | | | |
|---|---|---|---|---|---|
| 10pf | 50V | .05 | 680 | 50V | .05 |
| 22 | 50V | .05 | .001µf | 50V | .05 |
| 27 | 50V | .05 | .0022 | 50V | .05 |
| 33 | 50V | .05 | .005 | 50V | .05 |
| 47 | 50V | .05 | .01 | 50V | .07 |
| 68 | 50V | .05 | .02 | 50V | .07 |
| 100 | 50V | .05 | .05 | 50V | .07 |
| 220 | 50V | .05 | .1 | 12V | .10 |
| 560 | 50V | .05 | .1 | 50V | .12 |

### MONOLITHIC

| | | | | | |
|---|---|---|---|---|---|
| .01µf | 50V | .14 | .1µf | 50V | .18 |
| .047µf | 50V | .15 | .47µf | 50V | .25 |

### ELECTROLYTIC

| RADIAL | | | AXIAL | | |
|---|---|---|---|---|---|
| 1µf | 25V | .14 | 1µf | 50V | .14 |
| 2.2 | 35V | .15 | 10 | 50V | .16 |
| 4.7 | 50V | .15 | 22 | 16V | .14 |
| 10 | 50V | .15 | 47 | 50V | .20 |
| 47 | 35V | .18 | 100 | 35V | .25 |
| 100 | 16V | .18 | 220 | 25V | .30 |
| 220 | 35V | .20 | 470 | 50V | .50 |
| 470 | 25V | .30 | 1000 | 16V | .60 |
| 2200 | 16V | .70 | 2200 | 16V | .70 |
| 4700 | 25V | 1.45 | 4700 | 16V | 1.25 |

## DATARASE EPROM ERASER $34.95

- ERASES 2 IN 10 MINUTES
- COMPACT-NO DRAWER
- THIN METAL SHUTTER PREVENTS UV LIGHT FROM ESCAPING

## 1/4 WATT RESISTORS

5% CARBON FILM ALL STANDARD VALUES FROM 1 OHM TO 10 MEG. OHM

| | | | | | |
|---|---|---|---|---|---|
| 10 PCS | same value | .05 | 100 PCS | same value | .02 |
| 50 PCS | same value | .025 | 1000 PCS | same value | .015 |

## RESISTOR NETWORKS

| | | | |
|---|---|---|---|
| SIP | 10 PIN | 9 RESISTOR | .69 |
| SIP | 8 PIN | 7 RESISTOR | .59 |
| DIP | 16 PIN | 8 RESISTOR | 1.09 |
| DIP | 16 PIN | 15 RESISTOR | 1.09 |
| DIP | 14 PIN | 7 RESISTOR | .99 |
| DIP | 14 PIN | 13 RESISTOR | .99 |

## SPECIALS ON BYPASS CAPACITORS

| | |
|---|---|
| .01 µf CERAMIC DISC | 100/$5.00 |
| .01 µf MONOLITHIC | 100/$10.00 |
| .1 µf CERAMIC DISC | 100/$6.50 |
| .1 µf MONOLITHIC | 100/$12.50 |

## BOOKS BY STEVE CIARCIA

| | |
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| BIULD YOUR OWN Z80 COMPUTER | $19.95 |
| CIRCUIT CELLAR VOL 1 | $17.95 |
| CIRCUIT CELLAR VOL 2 | $18.95 |
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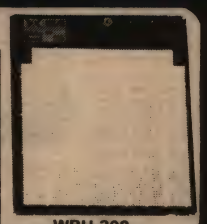
|---|---|---|---|---|---|---|---|
| WBU-D | .38 x 6.50" | 1 | 100 | --- | --- | --- | 2.95 |
| WBU-T | 1.38 x 6.50" | --- | --- | 1 | 630 | --- | 6.95 |
| WBU-204-3 | 3.94 x 8.45" | 1 | 100 | 2 | 1260 | 2 | 17.95 |
| WBU-204 | 5.13 x 8.45" | 4 | 400 | 2 | 1260 | 3 | 24.95 |
| WBU-206 | 6.88 x 9.06" | 5 | 500 | 3 | 1890 | 4 | 29.95 |
| WBU-208 | 8.25 x 9.45" | 7 | 700 | 4 | 2520 | 4 | 39.95 |



WBU-208

## LITHIUM BATTERY

AS USED IN CLOCK CIRCUITS

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|---|---|
| 3 VOLT BATTERY | $3.95 |
| BATTERY HOLDER | $1.49 |

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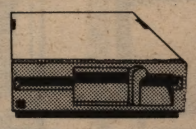
# 20MB HARD DISK SYSTEM ONLY $389.95!

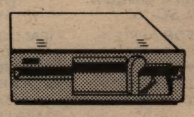
## DISK DRIVES
*FOR APPLE COMPUTERS*

**AP-150 $99.95**



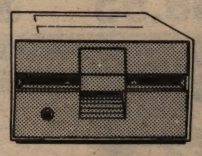
- ½ HT, DIRECT DRIVE
- 100% APPLE COMPATIBLE
- SIX MONTH WARRANTY

**BAL-500 $129.95**



- TEAC MECHANISM-DIRECT DRIVE
- 100% APPLE COMPATIBLE
- FULL ONE YEAR WARRANTY

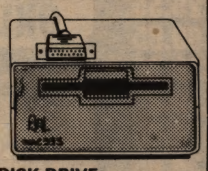
**AP-135 $129.95**



- FULL HT SHUGART MECHANISM
- DIRECT REPLACEMENT FOR APPLE DISK II
- SIX MONTH WARRANTY

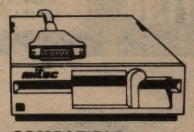
DOUBLE SIDED!

**MAC535 $249.95**



- 3.5" ADD-ON DISK DRIVE
- 100% MACINTOSH COMPATABLE
- DOUBLE SIDED 800K BYTE STORAGE
- HIGH RELIABILITY DRIVE HAS AUTO-EJECT MECHANISM
- FULL ONE YEAR WARRANTY

**AD-3C $139.95**



- 100% APPLE IIc COMPATIBLE, READY TO PLUG IN, W/SHIELDED CABLE & MOLDED 19 PIN CONNECTOR
- FAST, RELIABLE SLIMLINE DIRECT DRIVE
- SIX MONTH WARRANTY

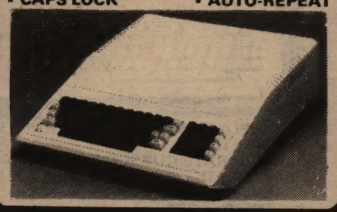
## DISK DRIVE ACCESSORIES

| | |
|---|---|
| FDD CONTROLLER CARD | $49.95 |
| IIc ADAPTOR CABLE | $19.95 |

*ADAPTS STANDARD APPLE DRIVES FOR USE WITH APPLE IIc*

## KB-1000 $79.95
*CASE WITH KEYBOARD FOR APPLE TYPE MOTHERBOARD*

- USER DEFINED FUNCTION KEYS
- NUMERIC KEYPAD WITH CURSOR CONTROL
- CAPS LOCK
- AUTO-REPEAT



## KEYBOARD-AP $49.95

- REPLACEMENT FOR APPLE II KEYBOARD
- CAPS LOCK KEY, AUTO-REPEAT
- ONE KEY ENTRY OF BASIC OR CP/M COMMANDS

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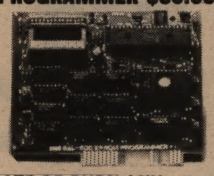
| IBM-AT | $68.00 |
| APPLE II | $45.00 |
| APPLE IIe | $45.00 |
| MULTIBUS | $86.00 |

## APPLE COMPATIBLE INTERFACE CARDS

**EPROM PROGRAMMER $59.95**

MODEL RP525



- DUPLICATE OR BURN ANY STANDARD 27xx SERIES EPROM
- EASY TO USE MENU-DRIVEN SOFTWARE IS INCLUDED
- MENU SELECTION FOR 2716, 2732, 2732A, 2764 AND 27128
- HIGH SPEED WRITE ALGORITHM
- LED INDICATORS FOR ACTIVITY
- NO EXTERNAL POWER SUPPLY NEEDED
- ONE YEAR WARRANTY

**16K RAMCARD $39.95**

- FULL TWO YEAR WARRANTY
- EXPAND YOUR 48K APPLE TO 64K
- USE IN PLACE OF APPLE LANGUAGE CARD

BARE PC CARD W/INSTRUCTIONS $9.95

**IC TEST CARD $99.95**

- QUICKLY TESTS MANY COMMON ICs
- DISPLAYS PASS OR FAIL
- ONE YEAR WARRANTY
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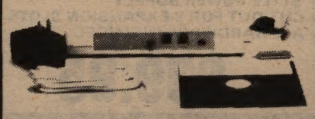
## 300B MODEM $49.95
*FOR APPLE OR IBM*

*INCLUDES ASCII PRO-EZ SOFTWARE*



- FCC APPROVED
- BELL SYSTEMS 103 COMPATIBLE
- INCLUDES AC ADAPTOR
- AUTO-DIAL
- DIRECT CONNECT

CABLE FOR APPLE IIc $14.95

## JOYSTICK CR-401 $7.95
FOR ATARI 400, 800, 2600, VIC 20/64 AND APPLE IIe

## DISKFILE
HOLDS 70 5¼" DISKETTES

**$8.95**

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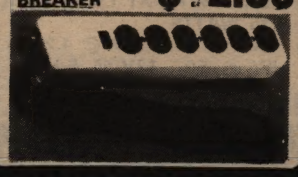
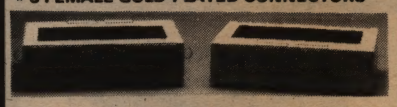
## POWER STRIP
- UL APPROVED
- 15A CIRCUIT BREAKER

**$12.95**



## 2 WAY SWITCH BOXES

- AVAILABLE IN SERIAL OR PARALLEL
- CONNECTS 2 PRINTERS TO ONE COMPUTER OR VICE VERSA
- ALL LINES SWITCHES
- PUSH-BUTTON SWITCHES MOUNTED ON PCB
- 3 FEMALE GOLD-PLATED CONNECTORS



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|---|---|
| AB-P CENTRONICS PARALLEL | $39.95 |
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## MOLDED INTERFACE CABLES
*6 FOOT, 100% SHIELDED, MEETS FCC*

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| CENTRONICS MALE TO FEMALE | 15.95 |
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| MODEM CABLE FOR IBM | 7.95 |
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| RS232 SERIAL MALE TO MALE | 9.95 |
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5¼" SOFT SECTOR DS/DD WITH HUB RINGS

| $9.90 | 69¢ea | 59¢ea |
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| BOX OF 10 | BULK QTY 50 | BULK QTY 250 |

NASHUA DISKETTES WERE JUDGED TO HAVE THE HIGHEST POLISH AND RECORDED AMPLITUDE OF ANY DISKETTES TESTED ACCORDING TO "COMPARING FLOPPY DISKS", BYTE 9/84

## DISKETTES

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| N-MD2F | DS/QUAD SOFT | $34.95 |
| N-MD2H | DS/HD FOR AT | $49.95 |

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*AS SEEN IN BYTE, OCT. 86*

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- READ, COPY OR VERIFY EPROM
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**ONLY $199**

KIT INCLUDES PCB AND ALL COMPONENTS EXCEPT CASE AND POWER SUPPLY

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| TEAC FD-55GFV ½ HT DS/HD (FOR IBM AT) | $154.95 |
| TANDON TM100-2 DS/DD (FOR IBM) | $119.00 |
| TANDON TM50-2 ½ HT DS/DD (FOR IBM) | $79.95 |
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|---|---|
| FD 100-8 SS/DD (SA/801 EQUIV) | $119.00 |
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## DISK DRIVE ACCESSORIES

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| TEAC SPECIFICATION MANUAL | $5.00 |
| TEAC MAINTENANCE MANUAL | $25.00 |
| ½ HT MOUNTING HARDWARE | $2.95 |
| MOUNTING RAILS FOR IBM AT | $4.95 |
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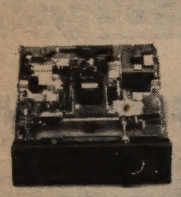
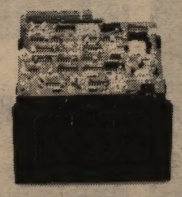
| 5¼" FDD POWER CONNECTORS | $1.19 |



TEAC FD-55



TANDON TM100-2

## DISK DRIVE ENCLOSURES

**CAB-APPLE $24.95**
APPLE TYPE CABINET W/OUT POWER SUPPLY

**CAB-1FH5 $69.95**
FULL HT 5¼" BEIGE CABINET W/POWER SUPPLY

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DUAL FULL HT 8" CABINET W/POWER SUPPLY

CAB-2SV5

CAB-1FH5

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- LOW BATTERY INDICATOR
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| 20MHz DUAL TRACE OSCILLOSCOPE | MODEL 2000 | $389.00 |
| 35MHz DUAL TRACE OSCILLOSCOPE | MODEL 3500 | $549.00 |

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# 20 MEGA BYTE HARD DISK SYSTEM ONLY $389.95!

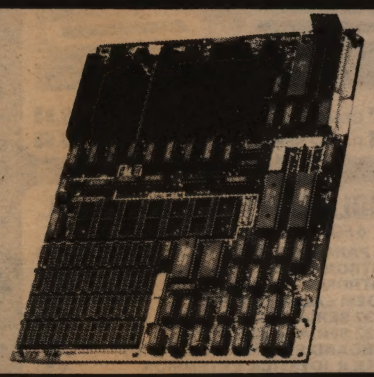
## SEAGATE ST-225 20 MB HARD DISK SYSTEM

INCLUDES HARD DISK CONTROLLER, CABLES AND INSTRUCTIONS. ALL DRIVES ARE PRE-TESTED AND COME WITH A ONE YEAR WARRANTY.

**$389.95**

## XT COMPATIBLE MOTHERBOARD

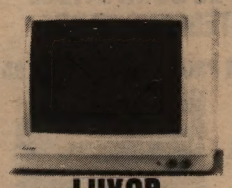
**$129.95**



- 4.77 MHz 8088 CPU, OPTIONAL 8087 CO-PROCESSOR
- 8 EXPANSION SLOTS
- 0K RAM INSTALLED, EXPANDABLE TO 640K ON-BOARD MEMORY
- ALL ICs SOCKETED-HIGHEST QUALITY PC BOARD
- ACCEPTS 2764 OR 27128 ROMS

**PRO-BIOS $19.95**

## CRT MONITORS FOR ALL APPLICATIONS



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**HI-RES RGB MONITOR**
*MODEL 190-9528*

- DIGITAL RGB-IBM COMPATIBLE
- 14" SCREEN
- 16 TRUE COLORS
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- RESOLUTION > 640 x 262
- .31mm DOT PITCH
- CABLE FOR IBM PC INCLUDED

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- 13" COMPOSITE VIDEO
- RESOLUTION: 280H x 300V
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- ONE YEAR WARRANTY

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- IBM COMPATIBLE TTL INPUT
- 12" NON-GLARE SCREEN
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AMBER VERSION $109.95

**$99.95**

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*ALL WITH A ONE YEAR WARRANTY*

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*PERFECT FOR THE 640K MOTHERBOARD*

- 2 DRIVE FLOPPY DISK CONTROLLER
- 1 RS232 SERIAL PORT; OPTIONAL 2nd SERIAL PORT
- PARALLEL PRINTER PORT
- GAME PORT
- CLOCK/CALENDAR
- SOFTWARE: CLOCK UTILITIES, RAMDISK, SPOOLER

*OPTIONAL SERIAL PORT $15.95*

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*ALL THE FEATURES OF AST'S 6 PACK PLUS AT HALF THE PRICE*

- CLOCK/CALENDAR
- 0-384K RAM
- SERIAL PORT
- PARALLEL PORT
- GAME PORT
- SOFTWARE INCLUDED

*PRINTER CABLE $9.95*
*64K RAM UPGRADE 9/$11.61*

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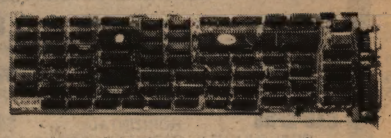
*FULLY COMPATIBLE WITH IBM COLOR CARD*

- 4 VIDEO INTERFACES: RGB, COMPOSITE COLOR, HI-RES COMPOSITE MONOCHROME, CONNECTOR FOR RF MODULATOR
- COLOR GRAPHICS MODE: 320 x 200
- MONO GRAPHICS MODE: 640 x 200
- LIGHT PEN INTERFACE

### MONOCHROME GRAPHICS CARD $89.95

*FULLY COMPATIBLE W/IBM MONOCHROME ADAPTOR & HERCULES GRAPHICS*



- LOTUS COMPATIBLE
- TEXT MODE: 80 x 25
- GRAPHICS MODE: 720 x 348
- PARALLEL PRINTER INTERFACE

### MONOCHROME ADAPTOR $49.95

*ANOTHER FANTASTIC VALUE FROM JDR!*

- IBM COMPATIBLE TTL OUTPUT
- 720 x 350 PIXEL DIPLAY

PLEASE NOTE: THIS CARD WILL NOT RUN LOTUS GRAPHICS AND DOES NOT INCLUDE A PARALLEL PORT

### FLOPPY DISK DRIVE ADAPTOR $34.95

- INTERFACES UP TO 4 STANDARD FDDs TO IBM PC OR COMPATIBLES
- INCLUDES CABLE FOR TWO INTERNAL DRIVES
- STANDARD DB37 FOR EXTERNAL DRIVES
- RUNS QUAD DENSITY DRIVES WHEN USED WITH JFORMAT

## BUILD YOUR OWN 256K XT COMPATIBLE SYSTEM

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| XT MOTHERBOARD | $129.95 |
| PRO-BIOS | $19.95 |
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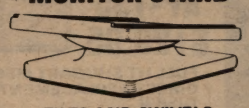
| 130 WATT POWER SUPPLY | $69.95 |
| FLIP-TOP CASE | $39.95 |
| DKM-2000 KEYBOARD | $59.95 |
| ½ HEIGHT QUME DRIVE | $79.95 |
| FLOPPY DISK CONTROLLER | $34.95 |
| MONOCHROME ADAPTOR | $49.95 |
| MONOCHROME MONITOR | $99.95 |
| TOTAL: | $611.10 |

## MONITOR STAND



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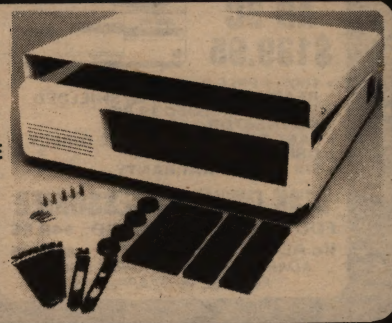

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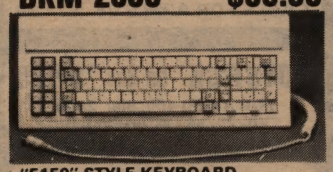

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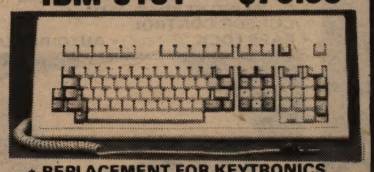

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